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# **Crew Management Administrative Processes and Information Technology Tools Aiming at Improving Productivity and Quality of Work— The Case of Marlow Navigation**

A project submitted to Middlesex University  
in partial fulfilment of the requirements for the degree of  
DOCTOR OF PROFESSIONAL STUDIES

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## **Acknowledgements**

I would like to dedicate this work to my grandfather Iordanis, who recently passed away. He taught me to appreciate the value of education, and, more recently, encouraged me to undertake the challenge of the Doctorate in Professional (DProf) studies. I also dedicate this work to my employer, Marlow Navigation, and all office colleagues that have, with their continuous and systematic efforts to give excellent service in an international and complex business environment, given me the incentive to choose my research topic.

Special thanks should be given to my consultant Professor Anthony Lane, ex Director of Seafarers International Research Centre and now Emeritus Professor at Cardiff University, and to my advisor Dr John Violaris, Dean of the School of Economic Sciences and Administration at Frederick University, for their valuable help and guidance that they provided throughout this Project.

Finally, none of this would be possible without the support and understanding of my wife, Maria, and children, Nicholas and Christina. I would like to thank them for their patience and love during my studies.

The completion of the DProf studies completes a personal goal that I have had ever since I first left university over 16 years ago.

Thank you all,

Angelos Menelaou

## Abstract

*The management of human resources (HR) in the shipping industry is a continuing object of cost management due to the fact that labour cost is becoming an increasingly larger element of overall operational costs. While the fleet of merchant vessels constantly increases in size and the global supply of suitable seafarers shrinks, shipping organizations struggle to administrate their personnel more efficiently. Third-party ship management companies may employ thousands of seafarers of a number of different nationalities and with varying terms and conditions of employment. Each one of these employees has an individual record detailing personal circumstances, qualifications, reports on ability, travel arrangements from country of origin, immigration formality requirements, etc. These aspects engender an extremely complex and cost-conscious environment, within which advanced, tailor-made information technology (IT) tools and optimized cost-efficient administrative shoreside working processes are a prerequisite for reliable and efficient HR management.*

***The main aim** of this project is to investigate the administrative environment of one of the world's largest crew management companies, 'Marlow Navigation' and to develop appropriate functional IT instruments and methods aiming at improving productivity and quality of work.*

***Methodology:** A questionnaire survey was conducted to gather data related to the administrative productivity of Marlow and the use of available IT applications. The approach consisted of two steps: 1) Descriptive statistics were used to provide quantitative descriptions of questionnaire results (problem identification); and 2) qualitative analysis, through 'focus group discussion', was used to identify the specific administrative areas where changes might be effected.*

***Findings:** Enhanced administrative productivity and improved quality of work were accomplished through an integrated system of crew management based on specialized IT instruments, innovative workflow and employees' multidisciplinary knowledge.*

***Originality/value:** The proposed key variables of the HR management system can serve as a model for other business organizations, providing a basis for innovative progression with the potential for differentiation from traditional commercial shipping practices.*

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## Glossary

TERM	DEFINITION
BIMCO	Baltic and International Maritime Council
CSC	Cyprus Shipping Chamber
COLREG	Collision Regulations
CRM	Crew Resource Management or Crew Management
DWT	Dead Weight Tonnage
FIS	Financial Info Screen
GAAP	Generally Accepted Accounting Principles
H.T.I	Higher Technical Institute
HR	Human Resources
HRIS	Human Resource Information Systems
HRM	Human Resources Management
IACS	International Association of Classification Societies
ILO	International Labor Organization
IMEC	International Maritime Employers' Committee
IMO	International Maritime Organization
ISF	Information Security Forum
ISF	International Shipping Federation
ISMA	International Ship Management Association
IT	Information Technology
ITF	International Transport Federation
KPI	Key Performance Indicator
MARPOL	International Convention for the Prevention of Pollution from Ships
MIS	Management Information System
M.O.U	Management Organization Unit
NEED	Nikkei Economic Electronic Database System
R&D	Research and Development
RMS – R	Resource Management Solution – Rail
SOLAS	International Convention for the Safety of Life at Sea
STCW	Standards of Training, Certification and Watch keeping (for Seafarers)
TFP	Total Factor Productivity
TQ	Total Quality
UNCLOS	United Nations Convention on the Law of the Sea



## Document Structure

- **Chapter 1: Introduction**

The first chapter outlines the background and reasoning behind the selection of the subject area of the project and presents its main aims and objectives.

- **Chapter 2: Literature Review**

The literature survey centres on writings concerned with the system and procedural applications of information technology and investigates the relevant trends in the shipping and other transport sectors where the function of crew management (CRM) takes place. The survey also examines literature on the process and measurement of innovation as well as on change management and organizational productivity.

- **Chapter 3: Research Methodology**

This chapter provides a detailed description of the methodology followed throughout the research. It also presents the main research questions and explores the role of the author as a worker/researcher.

- **Chapter 4: Crew Management Operations in the Shipping Industry**

This chapter describes the main crew management players and their roles and main activities. It also provides an overview of procedures and administrative practices within ship management organizations specializing in providing crew management services.

- **Chapter 5: Identification and Analysis of the Problem**

Through the analysis of questionnaire data and focus group discussion, this chapter identifies and analyses the main areas (of crew administration) where symptoms of low productivity were manifest. The degree of efficiency and effectiveness with which Information Technology (IT) is used in the company administration is also thoroughly examined.

- **Chapter 6: An Integrated Crew Administrative System**

This chapter introduces and presents a new CRM administrative system, discussing its functionalities and main advantages (the solution). Particularly, it explains how a successful integration of the various working processes is achieved using tailor-made IT instruments and new working practices. It further describes the means by which such IT instruments are smoothly implemented, after being meticulously tested, in the production process of a fully functional working environment. Here, the efficacy of action research is emphasized. Later, the chapter deals with the evaluation of the new system. It involves a comparison between previous and present administrative performance status, as the latter has been developed with the implementation and operation of the new system during the first four years. The positive impact on administrative productivity and other benefits are thoroughly explained.

- **Chapter 7: Conclusions & Reflections**

This final chapter summarizes the project's main activities and findings and discusses their implications for each of the main stakeholders. Primarily, it presents a summary of recommendations aiming at improving the function of crew administrative processes of "third party" ship management companies. Finally, a holistic reflective review of the author's personal learning and professional experience gained throughout the project process is also provided.

## Chapter 1: Introduction

The world's merchant ships carry some 95% of the world's internationally traded commodities; thus, ships' efficient functioning is fundamental for the world's social and economic development. This important contribution of shipping to the flow of international trade would not have been possible without a reliable supply and management of qualified seafarers. Although the function of managing seafarers has been traditionally carried out by the ship-owners themselves, in the late twentieth century, the lack of available qualified seafarers, in particular officers, together with increased operating difficulties and costs, induced many ship-owners to subcontract this assignment to third party specialist ship management companies.

*“Third party ship managers will contract to do anything the owner wishes. The owner may wish to keep the operation and technical management “in-house” but will hire the manager to undertake the often difficult HR functions in relation to the crew..... Something like one third of the world's fleet is in the hands of ship management companies, which themselves have been innovative in developing sophisticated systems of management.” (BIMCO, 2009)*

This continuing trend, in conjunction with today's highly competitive and complex business environment, challenges ship management companies to become more efficient and innovative. Many of the largest of them develop their own methods of running ships efficiently, organise the training of their own staff, and provide a promising career path for professionals ashore and onboard. As shipping itself becomes more specialised, the management companies adapt accordingly, in an effort to provide specialist services for every kind of fleet and ship-type.

Third party “Crew Management” activity is a service (tertiary) industry and, in that respect, shares quite similar volume, processing and operating characteristics to those of the airline, insurance and banking sectors. Today, one can say that airlines earn their money out of the reservations and connected flight bookings - and not out of the fact that their fixed assets fly from point A to destination B. The core service is offered via IT

communication and related internet links, which are proven to be efficient, cost effective, and reliable operating tools. Within the same line of thinking, one of the biggest challenges of a crew management company in the shipping industry is to exploit the advantages offered by new technology and advance business procedures to achieve full integration, (e.g. in business terms, integration from ‘order to supply’). This is of paramount importance, as integration provides the necessary basis for the control of time and cost. Control is imperative as it aids the measurement of the business performance against a background of a steadily increasing demand for the recruitment of seafarers.

Until recent years, crew management lacked the availability of a standard process model, in particular, for the so-called Supply Chain process. One can state that developments detailed in this thesis of Marlow Navigation’s administrative infrastructure, one of the world’s largest crew management companies, provides crew management companies with a basis for precisely the standard process model they previously lacked.

The recruitment of seafarers for ships has been (and still is) Marlow’s main business activity since its start-up in 1982. Today, the company supplies crew to nearly every type of commercial seagoing vessel; the approximately 11,500 crew members it employs at any given time are recruited via its own worldwide network of fully controlled offices.

*“Shipping industry is a major global business that employs about 1.23 million of seafarers, of whom 404,000 are officers and 823,000 are ratings” (Zhou and Amante, 2005:535-57 cited in Stopford, 2009:48) “with some smaller numbers employed onshore in various shipping offices and services”. (Stopford, 2009:48)*

The significant and constant increase in the number of Marlow seafarers, especially during the past decade, triggered the Directors’ decision to invest in methods of improving the company’s productivity at all organizational working levels. The need for efficient handling and control of the huge volume of accounts’ payable and related documentation was one of the main areas of their attention, mainly due to the fact that both the crewing operating as well as administrative cost had shown no significant economies of scale and the company’s total annual expenses’ turnover exceeded USD 230 million. It is worth mentioning that crewing costs typically constitute approximately 40% of a ship’s total daily operating cost, and thus plays a significant role in the overall

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financial performance of the ship (Stopford M., 2009). This unavoidably important cost factor requires efficient administrative processing and continuous control.

The author's current position at Marlow is that of a Project Manager, which involves duties related to the development and implementation of new systems and processes aiming primarily at the efficient handling of crew management administrative work. Such a role has offered me the opportunity to obtain an in-depth knowledge of the company's Management Information System (MIS), IT infrastructure and other parameters that are used extensively in this project work. The DProf research work has allowed me to produce a document which may easily be used by shipping companies as a powerful tool for the better organizing and controlling of crew management processes and working practices. It can reasonably be expected that the results of this research become a model for future effective crew management, out of which crew managers, their clients/principals, and seafarers will benefit most.

### **1.1 Aims and Objectives:**

This study aims to provide a thorough investigation and analysis of shipping's crew management functions and to recommend innovative IT instruments and operational methods aiming at improving productivity and quality of work. The main beneficiaries of the research will be those shipping organizations interested in growing and maintaining an innovation culture. Through the scientific techniques of this research, the benefits of a new administrative system will be explained and fully justified. Emphasis will be given in presenting the following operational and financial advantages that the proposed innovation/change can offer to shipping companies:

- Decreased employees' daily work load
- Better cost control
- Decreased operating cost
- Faster availability of data and better managerial reporting
- Improved communication and synergies between employees, sections, departments and associated companies
- Ability to effectively respond to market changes and competition's pressures

As mentioned, the 3<sup>rd</sup> party ship management company, being the “Crew Manager,” offers crew management services to customers, they being the “Ship-owners.” The Crew Manager mainly acts as employer for the seaman on behalf of his Ship-owner, and his contractual obligations is to select, recruit, and administrate qualified seafarers for a specific vessel. In that respect, this research proposes a new administrative system offering significant improvements for the effectiveness of crew management services. Therefore, as it costs much more to attract a new customer than to sell to an existing one, it should be expected that a shipping company adopting this proposed innovation would gain an important competitive advantage, and thus find its marketing performance more effective.

The positive impact to crewing business operation, which is derived from the proposed administrative system, will consequently provide a more serviceable employment environment to seafarers. Their travelling arrangements, salary payment processes and other operational activities will be planned, organized and executed in a more structured and automated manner. Through the new CRM system, the core service to seafarers becomes faster and more reliable. The efficient data communication and synergies between the crew manager and the other collaborating commercial players, such as the manning and port agents, will enable the seafarers to establish a more stable professional career as well as to improve their personal and family time planning. Therefore, their job security is expected to improve and their loyalty to the shipping company is expected to increase.

Finally, the project aims at contributing to the development of the Maritime Programme of Studies at Frederick University, where I am presently a lecturer of Human Resources Management (HRM) and Shipping Economics. Currently, no comprehensive academic study has been made to include an investigation and analysis of shipping industry’s crew management practices and related administrative methods. Hence, the main outcomes of this research work will be used to enhance the course syllabi of the subjects “Ship Management” and “Human Resources Management.” The newly developed course syllabus will equip maritime students with industry focused knowledge and skills, enabling them to more easily adapt to their employers’ future needs.

## **Chapter 2: Survey of Literature**

Although a number of studies have been carried out on administrative management in various industries, there is very little systematic, public-domain knowledge of shipping's crew management, especially in relation to the impact of technological changes on their performance and profitability. The first section of this literature review aims to highlight the general need of organizations to take up the benefits of information technology and to examine the extent to which relevant trends are observable in the shipping industry.

The second section examines the origin and development of Crew Management in industry generally as well as in shipping. Some peculiar administrative characteristics of crew management in the shipping industry, as presented in various pieces of associated studies and writings, will be identified and explained. It should be noted that the current research work aims to study in detail these characteristics in order to optimize the proposal for an innovative and effective crew management administration.

Literature review of the third section emphasizes the importance of process and measurement of innovation. These are areas that are very rarely monitored and controlled in a systematic manner within shipping organizations. This research work aims to present some structural approaches and 'management of change' policies that were recently applied at Marlow Navigation in an effort to continuously generate, monitor, and evaluate innovations.

Finally, the last section presents interesting concepts of productivity, which is a key indicator for the measurement of administrative efficiency and effectiveness. The research deals with quantitative measurement of productivity and analyses its relationship with technological developments and related working processes previously introduced and implemented within the operating environment of Marlow Navigation.

## **2.1 Shipping Human Resources Management and Information Technology**

Over the past two decades, the shipping industry exemplifies areas in which IT solutions play a crucial part in successful business operation. Shipping companies use advanced fleet management technological tools that allow them to share or transfer information, monitor all transactions, and analyse management and financial performance. Specialized software for ship management helps, among others, in accounting, payroll, document control, and crew management. Moreover, the transportation industry has the ability to process and handle much of their traditional paper transactions electronically, which has allowed for greater accuracy, and reduced operating cost (IMS INC., 2007)

Branch (2007:77) explains that ship manning today forms a very important part of the shipping industry in an increasingly competitive cost-conscious and complex environment. He emphasizes the trend of new technology being introduced to the industry whilst economic change to the operating environment is continuous, and concludes that the objective of ship management operations is to optimize the use of resources compatible with commercial requirements.

The growth of third party ship management has been essential in the past decades and has been the outcome of companies' pressure to adopt new technology in order to improve the quality and efficiency of their operations. BIMCO (2009) reports that there are numerous advantages in employing ship managers, such as their ability to outsource many difficult and labour intensive elements of ship operation and management. It is an arrangement that suits an industry where demand for ships and commodities is notoriously cyclical. It also enables a small or medium sized owner to operate the vessels without the need for a large in-house organisation. Moreover, placing this small fleet with a sizeable ship management company will automatically acquire the advantages of being part of a larger fleet, such as excellent purchasing power for stores, repairs and other matters, which the manager in command of a large fleet is capable to obtain.

There have also been changes in the organizational structure with the appearance and development of management companies, and the extension of 'flagging out' and 'second registers' (McConville, 1999). Much of the attention in services has been focused on the



professional, financial, and telecommunications areas. It is worth mentioning that the physical transportation of goods in international trade is itself a service (White, 1988).

The impact of IT on HRM is an issue that has been addressed by a number of researchers, as IT demonstrates, among others, a direct link to companies' competitiveness and labour productivity. Monsalve and Triplett (1990 cited in Snell et al., 1995:160) suggest that the reason why opportunities provided by IT are rarely fully utilized in HR management is lack of a workable framework that conveys how IT can be leveraged to exploit its benefits with HR. Snell et al. (1995:159-172) attempted to provide such framework. They point out three basic aspects of its impact on HR management.

1. IT improves operations - automates processes as well as creates new information, previously unavailable. IT allows storing and retrieving of large amounts of information quickly and inexpensively.
2. IT can also enhance relational exchanges between individuals and sectors and therefore reduce cycle time, increase quality of service and freeing HR managers' time to be used for client-oriented actions and problem solving.
3. IT provides connectivity, accuracy, and speed, thus allowing identifying, acquiring and allocating of HR, creating virtual teams and more flexible networks. From this point of view, IT significantly contributes to the transformation of whole organizations.

Broderick and Boudreau (1992) describe findings of a Project in the Centre for Advanced Human Resource Studies at Cornell (based on research and interviews with 500 companies) that suggest that investments in IT can significantly enhance HR management contributions to competitiveness of firms. The authors state that most of the interviewed firms do not take full advantage of possibilities offered by IT tools. Although IT can improve HR administrative, operational, and planning decisions, most organizational investments in HR information technology so far support only administrative decisions associated with payroll and record keeping.

Broderick and Boudreau examine how IT, can support HRM, identifying three types of application related to different firm-level strategies identified by Schuler and Jackson:

cost leadership, quality/customer satisfaction, and innovation (1987 cited in Broderick and Boudreau 1992:9).

1. Transaction processing/reporting/tracking systems – support routine high volume HR decisions. IT tools play a crucial role in minimizing paper handling and recording. Thanks to IT tools, HR management not only decreases expenses but also provides information faster and more accurately. Transaction processing/reporting/tracking systems improve cost leadership, and free up HR management time that can be spent improving quality of services and on innovative initiatives.
2. Expert systems – once programmed, they distribute their expertise throughout different units of the organization. They decrease training costs and need for experts, provide teams with expertise, and free up lots of time. Hence, they support all three firm-level competitive strategies described by Schuler and Jackson.
3. Decision support systems – designed to increase chance of innovation in all areas of HR competitive objectives. The tools facilitate the organization's learning cycle from discovery to operating routine.

Broderick and Boudreau, although convinced of the significant role of information technology tools in HR competitive advantage, stress the need for concrete measurement methods, without which estimating their true value is impossible.

It is clear that the need for conducting this project study on IT impact on Crew Management grows in view of the trend for further development of third party ship management companies. Such business entities operate in a competitive, data volume oriented and complex environment where the challenge for technological progress becomes unavoidably significant.

One of the main aims of the research is introducing and analysing innovative IT tools and methodologies that once implemented can significantly improve the efficiency of the entire crew management administrative process. Among others, the research will attempt to answer the question of why IT benefits are not yet adequately explored by the shipping companies that offer crew management service.

## 2.2 Crew Management in Other Sectors

In the 1970's, NASA developed a training program known as Crew Resource Management (CRM) aiming at improving operation safety. Cognitive and interpersonal skills rather than technical competences are the basic concerns of CRM. The first generation CRM courses focused on psychological factors, such as style of leadership, assertiveness and interpersonal communication. The courses advocated general strategies of interpersonal behaviour but did not provide clear definition of appropriate cockpit behaviours. As the training evolved, the course became more team oriented and from cockpit personnel expanded to other groups - flight attendants, dispatchers and maintenance personnel. CRM has been integrated to technical training and became a part of all flight trainings. Specific modules address issues such as team building, briefing strategies, stress management, situation awareness and decision making. The basic idea of CRM is based on the assumption that error is inevitable as far as human factor is present. The benefits of non-punitive approach to errors and developing strategies of error management are stressed.

CRM can be seen as a set of error countermeasures with three lines of defence - avoidance of error, trapping incipient errors before they are committed, and finally, mitigating the consequences of those errors which occur and are not contained (Helmreich et al., 1999). During the 1980s and 1990s CRM was adopted by many other industries - military aviation, shipboard crews, medical/surgical teams, offshore oil crews, nuclear power plant operating crews, rail industry and other high-consequence, high-risk, time-critical industries (Morgan et al. 2006).

So far, there have been no systematic analytical writings on crew management in the shipping industry. Such literature as there is consists of handbooks written either as textbooks or as instructions by individual shipping companies and shipping organizations such as ISMA, ISF, and P&I Clubs.

Lloyd's Maritime Academy refers to crewing as one aspect of the greater field of ownership, ships operation and ship management, which itself is a part of the shipping industry that covers all main areas of international transportation and international trade.

In the same source, it is explained that the role of crew management reveals the broad and valuable spectrum of services that can be obtained in many parts of the world for the third party management of seafarers that ensures the ship owner/manager gets value for money. (Roger, 2008)

Schinas (2008) states that the major difference between shipping operators and other transport industries (airlines, trucking companies, rail operators) lies in employment schemes – seafaring crews are assigned to their tasks for much longer periods of time. He emphasizes that maritime operators do not enjoy the long term planning and scheduling period as in other modes, and at the same time they do not face as high fixed labour expenses as in other transportation modes. In the contrary to what is happening with ships, in most of the cases technical inspection and maintenance of airplanes, rail tractors, busses and trucks is executed every day or after short operational periods. This practice allows the existence of advanced maintenance policies and programmable technical support. Another difference results from ships’ institutional freedom of the seas. The Master, unlike in other transport industries, has vast decision-making liberties. Nevertheless, Schinas concludes that human element productivity is required to be retained at high levels, measured not only in pure quantifiable terms but also in quality, in all aspects and procedures of marine operations and maritime decision-making.

Airline companies rely on crew management tools in their constant effort to improve labour productivity and achieve operating efficiency. Advanced software systems automate the scheduling process, help them to deal with crew, logistical, and contractual requirements, as well as cope with the unpredictable, such as sick crews or delayed flights.

Lufthansa dedicated four years to developing crew planning. Individual wishes of 18,500 Lufthansa staff (their preferred routes, languages and requests for days off) can be taken into account thanks to advanced electronic request and planning systems. Jens Appel, head of crew planning, states:

*‘Cost efficiency obviously plays a big role when you have a workforce of this size. On the other hand, it's crucial to create a working environment that staff is happy with. After all our staff is central to the service we provide.’* (Eckardt, 2008)

Cathay Pacific is an example of another airline that decided to invest in a sophisticated crew management software solution. Chris Hoyland, Cathay Pacific's manager of integrated crew management, explains that on-going expansion and increasing complexity of industrial and legal rules has highlighted the need of better, faster, comprehensive crew management tools. Although it is a large investment in terms of cost and resources involved, the expected result is significant efficiency improvement and, in the end, cost reduction. 'Ultimately, we can make more timely decisions through the graphical user interface presentation of information and decision support functionality. The system will promote better communication of necessary information both within crew control and with other departments' (Hoyland, 2006).

The railway industry also implements advanced tailor-made software that helps to utilize human resources and improve cost efficiency. For instance, Resource Management Solution - Rail (RMS - R) was used during 2000 Sydney Olympics to generate optimized crew shifts with Day-of-Operation management capability. The system reduced the preparation time for new crew plans from months to days, enabled late timetable changes to be handled quickly and effectively, and allowed management to plan ahead by examining 'What-If' scenarios. (<http://www.jeppesen.com/documents/land/RailCorp-crewmgmt.pdf>)

### **2.3 Process and Measurement of Innovation**

The DProf project not only aims to introduce an innovative seafarers' crew management system, but also to explain the process of smoothly implementing the various related functionalities and, more importantly, to reveal its main advantages and benefits offered to shipping organizations. It is worth mentioning that traditional shipping HR administrative processes, which are still currently in effect, lack integration, optimum control, and performance. Since the proposed system holds all the basic characteristics of a 'new idea' or 'change' that improves current industry practices, it can rightfully be classified as an 'innovation'.

Luecke and Katz (2003:11) define innovation as a successful introduction of a new thing or method. Innovation is, according to the authors, ‘the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services’.

Innovation is not simply something new but rather ‘the new’ successfully applied in order to make a significant difference in an organization’s performance. The process of implementing innovation in organizations, in order to succeed, requires structure and discipline. First of all, it must be clear why the innovation is advisable and what benefits it is supposed to bring to the organization. The goals must be clearly defined and actions leading to accomplishing the goals specified and well planned. Monitoring of the results, feedback and, when necessary, adjustment of actions are also essential. Furthermore, teamwork, clear communication, and access to information for all involved play crucial parts in successful implementation of innovation.

The need to align business processes and organizational structure with the ‘change’ and to measure innovation’s results becomes particularly important in the aftermath of the introduction and implementation of new technologies and IT instruments, being factors that unavoidably create a strong culture of ‘change’. The DProf research work will present a number of innovative IT tools and analyse the new working processes that are designed and maintained in order to support the relevant implementation processes and to further improve the continuous functioning of the administrative operation. As previously mentioned, the structured approach on work processes, which has been applied in Marlow Navigation, will be explained in Chapter 6 and the outcomes of this approach will be identified and thoroughly evaluated. This section will examine literature that analyses and exploits the process and measurement of innovation.

### **2.3.1 Innovation Process**

Davenport (1992) got involved in research in application of information technology in redesigning business processes in the mid 1980s when organizations only recently started to implement IT tools in an effort to redesign their business processes. He opts for an approach called Quality Orientation (“emerging business philosophy” at that time) which combines process improvement and process innovation. His study states that although

there is no universal approach to process innovation, there are some key activities that seem to be critical - selection of processes for redesign, structured consideration to enablers of innovation, creation of vision, good understanding of existing processes, and detailed designing of new processes and organization.

Davenport explains that information technology plays a crucial part in process innovation as an enabler as well as implementer of process change. Opportunities provided by information technology vary from automation of work, changing a sequence of processes, and eliminating process intermediaries to enabling a process to work over great distances. Examining successful process innovations of well-known organizations led to the conclusion that a cycle of designing and implementing a change usually takes a couple of years. As various processes are interconnected, successful innovation in one of them leads to redesigning others; therefore, long-term orientation is required. In Davenport's opinion, process innovation is a prerequisite for companies to stay in the market. Moreover, there is no point investing in information technology and human capabilities without process innovation context.

Madnick (1991: 27-60), Schnitt (1993) emphasize that in order to gain improvements in productivity, processes automation and integration must be accompanied by reengineering HR processes.

Kuczmarski et al. (2001) report that the process is the essential set of tools that platoon members use to give form and substance to the company's innovation priority and the initiatives stated in its policy. The authors explain that the purpose of an innovation process is to:

1. Provide a structured approach for systematically and continuously generating innovations
2. Enable formal decision and go/no-go approval points to guide innovation decisions and prioritization
3. Efficiently track the number of innovations in each stage of development to ensure that an organization is on target to meet stated financial and strategic goals

Strong evidence supporting the benefits of innovation process is given by the 1999 Kuczmarski et al study of over two hundred companies across industries, which reported

that the most successful innovative corporations (73.6%) have a formal new product development process in place (Kuczmariski et al, 2001:143).

Lai et al. (2004) reported that among the major factors that contributed to the need for the development of quality management systems in the logistic industry are the rise in quality awareness, the increase in customer pressure, and the need to install a mechanism to improve work processes.

Evans (2005) comprehensively suggests that an organization adopting a Total Quality (TQ) philosophy needs to introduce and establish significant changes in design, work process, and culture. It is not effective to just use quality tools such as Six Sigma, unless those are accompanied with relevant changes in organizational process and culture. He emphasizes that the philosophy of TQ involves a combination of basic key management concepts, such as customer and stakeholders focus, process orientation, and continued improvement and learning.

Kundu et al. (2007) emphasized that the need of organizations for people and people for organizations will be more difficult to satisfy in today's competitive business environment. A firm's competitive advantage could be produced from human resources (HR) and firm performance is influenced by a set of effective HRM practices. He draws attention to shipping companies' practices, such as training and performance appraisal, hiring and compensation systems, career development, job analysis, HR planning, workforce diversity, and flexi-work systems. An important factor supporting HR practice are Human Resource Information Systems (HRIS) defined as 'interrelated components working together to collect, process, store and disseminate information to support decision making, coordination, control, analysis, and visualization of an organization's HRM activities' (Laudon and Laudon, 1998 cited in Kundu et al., 2007:78).

In their White Paper 'Innovation Process Management' (2007), Microsoft concludes that a key issue with innovative technological tools is that it appears to be an ad-hoc process. It is emphasized that successful companies use processes that provide a structure and methodology in order to guide invention to innovation. As a result, good processes ensure that a company is doing the right things in the right way with efficiency. They



ensure that organizations are focusing on innovation, consciously managing resources, making timely decisions, and balancing current needs with future goals.

### **2.3.2 Innovation Measurement**

An important part of this project work will focus in measuring the benefits which can be obtained through the implementation of new Information Technology tools and working processes in third party crew management companies. As mentioned earlier, such new tools aim at offering a number of real and measurable benefits to the company, its employees, and clients. The research will provide strong evidence of improved productivity and better cost control, being the key factors of competitiveness that [the innovation] has produced to all crew administrative organizational sections of Marlow Navigation. In that respect, it has been considered as quite important that the following brief survey on the subject 'Innovation Measurement' is conducted.

In a report of the Advisory Committee on Measuring Innovation in the 21st Century Economy (2008) we find the following definition of innovation: 'The design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the firm.' Although there is no established way of measuring innovation, various sources, (e.g., Smith (2005), Rogers (1998)) emphasize the importance of measuring results of implemented changes.

Rogers (1998) defines innovation as the application of new ideas to products, processes or any other aspects of organization's activities that lead to improvements in the organization's performance. The multifaceted nature of innovation implies many difficulties in measuring it. In order to measure something we need to quantify it with data. Innovation is usually measured by data provided by surveys, R&D patents, trademarks, etc. Although each of the measures is valuable, none of them can stand for a general innovation measure. Therefore, it is difficult to talk about universal measures of innovation. We can, however, point at some indicators of innovation.

One method of assessing innovation is distinction between outputs of innovating activity in and inputs to innovating activity. The key output measure of innovation is an

organization's success (also measured by various indicators). Another measure of innovative output is number of new or improved products or processes introduced. An alternative measure of innovative output might be statistics of intellectual property (patents, trademarks, designs). The inputs to innovation include R&D, patent data (can be considered as both input and output), acquisition of technology from others, expenditure on tooling up, industrial engineering, and manufacturing start-up associated with innovation, and training and marketing expenses related to innovative products or processes. A disadvantage of these methods is that the units of measurement are often not equal and, therefore, it is impossible to combine them to obtain an overall measure.

An alternative approach (most commonly applied with R&D data) uses econometric analysis in order to relate various innovation measures to overall organizational performance. Rogers emphasizes the importance of expansion of methods measuring innovation in order to provide an overall measurement.

Kuczmarski et al. (2001:5-6) reported that 'innovation is virtually boundless as long as a new benefit is realized and brought to fruition.' The authors emphasize that 'Innovation brings a new perceived benefit. The benefit may be functional, psychological, emotional, or financial. The range of benefits can be from minimal to massive. For example, a process innovation could bring a time-saving benefit to employees'.

The Advisory Committee on Measuring Innovation in the 21st Century Economy (2008) came to conclude that innovation measurement should not be static. More specifically, it reports that the measurement is an iterative process which needs to be treated less like a 'project' and more like an on-going 'dialogue.' Learning and improvement are to be gained from each stage of the process. One of the guiding principles endorsed by the Advisory Committee was that innovation data collection efforts should build on the way firms assess the effectiveness of their innovative activities. The Committee recommends that the business community:

- Create, expand and assess firm and industry level measures of innovation and develop best practices for innovation management and accounting.
- Participate in research activities and, as appropriate, make innovation information available to researchers.

## 2.4 Change Management

Innovations are typically the outcome of lateral rather than channelled thinking. This is what is implicit in the colloquial managerial expression, 'looking outside of the box' (De Bono, 1967). Creative thinking of this kind will normally be the starting point whenever the 're-engineering' of structures and/or associated processes is being considered. Here there is a two-step mode of thinking. In the first instance, there will be a view that the current procedures for attaining objectives might be reconsidered because there is a perception that existing procedures no longer seem best fitted because the wider operating environment has itself changed. In these circumstances the second step is the creative and innovative one; the one that requires the devising of more effective means of securing those objectives that are fundamental to organisational success and survival.

Lewin (1969) stated that successful organisational change requires the completion of three stages: unfreezing, moving to a new level and refreezing group life on the new level. This Dprof. project was developed and managed in accordance with Lewin's work guidelines and introduces an organisational change (new administrative process and IT instruments) through action research. The core philosophy is based on the collaboration between the researcher and the organisational members while understanding that those members should own their problems and be able to provide solutions. The detailed methodology of the research is explained in the next chapter.

There are several models of implementing a planned change that follow the Lewinian model. Dr John Kotter (1996), who taught Leadership at Harvard Business School completed a ten-year study of more than 100 companies and reported that more than two-thirds failed to produce the expected results of a change. His study concluded that a change process should follow a series of phases that usually require a considerable length of time. Moreover, it emphasised that:

*'skipping steps creates only the illusion of speed and never produces satisfactory results and making critical mistakes in any of the phases can have a devastating impact, slowing momentum and negating hard-won gains'.*

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Kotter summarises the following eight phases that appeared to make a change effort successful:

1. Establishing a sense of urgency
2. Forming a powerful guiding coalition
3. Creating a vision
4. Communicating the vision
5. Empowering others to act on the vision
6. Planning for and creating short-term wins
7. Consolidating improvements and producing still more change
8. Institutionalising new approaches

John Ivancevich et al. (1993: 744) report in the book '*Organisational Behaviour and Management*' that change requires adaptation, and consequently resistance to change is a major potential problem when changes/developments are introduced to an organisation. The authors report that approaches for dealing with problems of resistance include education and communication, participation and involvement, negotiation and agreement, manipulation and co-optation and various forms of coercion.

Pardo del Val et al. (2003:14) emphasise the role of training in managing change. The authors explain that training could be a good tool to help overcome the resistance caused by communication barriers as well as to help reduce the cost and delays derived from the gap between the present situation and the capabilities required for the change process.

Gravenhorst's study (2003) suggests that we shall take a different view of resistance to change and explore why willingness to change is so rarely evident. He suggests that CEOs and top managers do not need to think they have to overcome the resistance of employees but rather that they simply have to design change processes in such a way that groups can work together and realise the benefits of the change: improving the organisation and their work.

Effective change requires, as de Bono tacitly suggests, that we have first to understand the way the current situation works and that we are clear about how we want the new one to function. It also requires careful measurement of the effectiveness of the different

modelling approaches—for example, process flow diagrams—as a means of engaging staff in debate regarding improvements (Valerie Iles & Kim Sutherland, 2001).

Studying the electronic banking innovations of 4,293 credit unions that had relationships with 55 providers from 2000–2004, Weigelt, C. and Sarkar, M. (2005) highlight the importance of considering the type of technology solution utilized by providers' experiential diversity, as well as client-level organisational variations, when studying how firms learn from others' experiences in adopting innovations. The Weigelt and Sarkar study concluded that the adoption of client firms' innovations can be influenced by the experiential learning of their supply-side agents, such as consultants and technology solution providers.

Schaffer (2010: 87–91) emphasises the importance of small 'model' experiments prior to the introduction of organisational change. He explains that carefully selected and designed small breakthrough experiments create a kind of dynamism through focus and success and encourage managers to give it a try. This DProf. project adopted this approach. Specifically, the prior implementation of a new process or a new IT instrument into the live working environment, in which small working groups are appointed, has to be tested in a controlled environment where the results are easily identified and evaluated. These tests, taking on an experimental nature, proved to be critically important for the smooth implementation and adoption of major organisational changes in Marlow Navigation.

## **2.5 Concepts of Productivity**

As third party crew management exemplifies a high volume sector, innovation at first place lead to optimized processes that support routine high volume HR procedures. In order to measure productivity levels of crew management operations, the appropriate input and output parameters have to be established. This is a relatively sensitive task because inputs or outputs are not always defined based on quantitative terms, but frequently involve important qualitative factors such as employees' motivation and customers' satisfaction. My research work aims to combine and carefully analyse all necessary factors to the live business environment of Marlow Navigation in order to

enable the accurate determination of crew management productivity levels. Specialized productivity indicators will be introduced, fully suitable to provide the basis for process efficiency and effectiveness evaluation. As a result, the 'net results' which are derived from the influence of innovative IT operational instruments, will be determined and a proposal for an efficient shipping Crew Management administration will be produced. The sequence of this section provides a literature survey on productivity performance, focusing on its relationship with IT instruments and the organizational structure within which they are developed and functioning.

Traditionally, labour productivity is measured as the ratio of volume measure of output to a volume measure of input, and as input is considered worked hours, number of people employed and workforce (OECD, 2002 cited in Schinas, 2008:4). Finally, a thorough analysis of academic literature for the terms "labour productivity" and "maritime business" and "shipping" yields only a publication dated back in 1988 (Bendall, Stent 1988 cited in Schinas, 2008:4) and case analyses of shipyards and seaports. Bendall and Stent approach productivity in macro-terms for Australian flagged vessels, as ratios of crewmen per installed horsepower, etc. (Schinas, 2008:4).

Solow (1987 cited in Lehr and Lichtenberg, 1999:335) stated: *'You can see that computers are everywhere but in the productivity statistics.'* This statement triggered a discussion on relation between investments in information technology and productivity growth. Some studies failed to prove that investments in IT result in enhanced productivity (e.g., Bailey, Gordon, 1988, Loveman, 1990 cited in Lehr, Lichtenberg, 1999). This has resulted in the concept of 'productivity paradox,' which refers to lack of evidence of the connection between investments in IT and productivity growth. Brynjolfsson and Hitt (1998:5) argue that one of the reasons of lack of the evidence lies in imprecise methods of measuring productivity. 'The quirks of productivity measurement are easily seen in banking. ATMs reduced the number of checks banks process so, by some measures, banking output and productivity decreased'. A number of later studies, however, detected evidence of a positive impact of IT technology on productivity, and therefore cast doubt on the concept of the productivity paradox. 'There is a consistent finding that IT has a positive and significant impact on firm output contradicting claims of a productivity paradox' (Brynjolfsson and Hitt, 1998: 6).

Lehr and Lichtenberg (1999) present findings of their research on impact of information technology on productivity. The study was based on data from government and private data sources from years 1977-1993 and has confirmed significant contribution of information technology to productivity growth. The returns of investments in IT appear to have peaked in 1986 or 1987.

*‘Computerization does not automatically increase productivity, but it is an essential component of a broader system of organizational changes which does. As the impacts of computers become greater and more pervasive, it is increasingly important to consider these organizational changes as an integral part of the computerization process.’* (Brynjolfsson and Hitt, 1998: 11).

Tolentino (2004) introduces an evolution of the concept of productivity. His theory explains that due to rapid changes in economic realities, especially changing needs of customers, competitiveness, and globalization, the concept of productivity has to be broadened and viewed as a factor of not only efficiency but also effectiveness. This means that services and products must create a value for customers (effectiveness), whereas processes should constantly be being improved to create the best results in the easiest, cheapest, and fastest way (efficiency).

The concept of input and output has changed as well. Whereas previously they were physical and value measures, nowadays, social and ecological factors are also taken into consideration; thus, one of determinants of productivity is minimizing negative social and ecological impacts. Another trend emerging in the concept of productivity underlines that not only the end result but also the processes used in improving products and services count. According to this approach, only processes improving quality of work are considered productive. An intangible output created during attending to the processes developed by an organization cannot be overlooked. Experiences of employees involved in the operations influence their attitude towards the organization and therefore affect productivity. Productive processes should provide positive experience and enable employees to gain new competences, which will help them to fully participate in constant improvement and innovation. The importance of the human factor must be taken into consideration. The success of an organization depends strongly on human and social capital. Human capital consists of skills, competences, and attitudes of employees’.

Social capital refers to relationships between employees and between organizational units and chains of connections of the organization. Highly skilled, motivated, innovative, and dedicated people who share the same values, communicate effectively, and cooperate with each other are the source of competitive advantage of organizations.

Summarizing, the new concepts in defining productivity are: effectiveness is as important as efficiency; attention must be given to the process, not only the result; an effective network can significantly improve productivity; the importance of environmental, social, and human factors must be taken into consideration. Tolentino concludes that a single measure of productivity must be replaced by a family of measures to capture various aspects of the modern productivity concept.

Shunsuke (2007) conducted productivity analyses for Japan's shipping industry with a particular focus on maritime shipping firms using Nikkei Economic Electronic Database System (the NEEDs database). He found that the total factor productivity (TFP) for three major firms was mainly caused by technological rather than efficiency change. His study explains that productivity is the key element of long-term economic growth, mainly due to the fact that input-driven growth, such as capital-oriented growth, is not sustainable in the longer term because of diminishing returns to inputs. It further suggests that the developing trends of these maritime firms might reflect the restructuring of the organization in addition to the application of new technologies.

The reality of the current global recession makes a study conducted by Leon-Ledesma and Christopoulos (2009) particularly worth mentioning. Productivity in the aftermath of 309 recessions across 70 countries between 1960 and 2000 has been examined. Findings of the study reveal that, from the last year of a recession up to four years after, recessions have a negative cumulative effect on productivity. The significant negative productivity effect of recessions results from a mixture of mechanisms. Although recessions can have a positive effect on frontier productivity, the fall of technical progress outweighs these level effects, leading to general productivity decrease. Long lasting recessions negatively affect frontier productivity to a larger extent, whereas deep recessions have stronger negative effects on efficiency.



Nowadays, most shipping companies and affiliated organizations are prepared for the next step due to the various quality management systems that are in place; these systems are used to gather the required data and they have contributed to the establishment of a quality culture. In practice, the introduction of quality management systems in shipping companies, either as managerial decision or as a side effect of ISM, introduced the ideas of measuring and reporting, focused on safety issues. This brought along a monitoring system for the 'deliverable' along with cost-control practices. This situation resembles industrial and service corporations in mid-90s', which had a quality system, and the next step was necessary to capitalize this corporate activity and function. It should be noted, however, that in all cases, monitoring of human element productivity and performance was the wider scope. My research work specifically aims to identify and bring into a manageable level the key elements that can influence productivity of crew management administration.

## Chapter 3: Research Methodology

### 3.1 Action Research

The research approach best suited to this project is ‘action research’, which is an ideal method of progressive problem solving. The aim of this was to introduce and evaluate changes in administrative processes and work organisation in Marlow Navigation Co. Ltd; I was a senior manager at this firm, and directly involved in designing and implementing changes intended to improve productivity.

*Action research is a reflective process of progressive problem solving led by individuals working with others in teams or as part of a ‘community of practice’ to improve the way they address issues and solve problems. Action research can also be undertaken by larger organizations or institutions, assisted or guided by professional researchers, with the aim of improving their strategies, practices, and knowledge of the environments within which they practice. (Riel, 2010)*

Historically, this method has rarely been used, largely because it is extremely difficult to insert external researchers into organisations and because of reservations as to the possibility of ensuring observer objectivity. These objections were often based on the assumption that only independently employed researchers are capable of conducting scientific studies. In more recent decades, and presumably because of the considerable increase in the numbers of social science graduates which has resulted in greater awareness of social science methods, action research has been ‘rediscovered’ as a useful technique for examining the making and operation of policy initiatives, for example in the UK’s health and education sectors (Smith M. K., 1996, 2001, 2007).

Operationally, Kurt Lewin provided the now classic methodological outline: ‘[action research] proceeds in a spiral of steps each of which is composed of a circle of planning action and fact-finding about the result of the action’ (Lewin, 1952). Given my position with Marlow as a project manager, I was very well placed to select and follow the core model approach of planning and evaluation. In that context, I was authorised by Marlow’s

Top Management to collect information about various business aspects and bring them back to the 'working Marlow community'. The aim of this was to promote reflection and move toward desired objectives.

The advantages and suitability of the action research method have typically been justified on three grounds: Firstly, in general, the activating stage and processes of decision making may be too immediate to be adequately examined by resort to standard *ex post facto*, top-down managerial methods. Secondly, standard observational techniques such as participant observation may not be feasible where researchers wish to get close to groups/organisations but are excluded due to fears of communication leakages to external contending parties. Thirdly, by reason of its involvement in the immediacies of practice, action research can potentially enhance organisational structure and functions.

It should be noted that the research process within organisations is not straightforward. Wilson (2000) states that prior to the commencement of the research process, the goals must be simultaneously clearly identified and have adequate persuasive influence and sufficient weight to convince the manager to invest effort, time and money in changing aspects of organisational structure, technology, tasks or staff. He argues that the normal social and 'political' dynamics of organisations makes them resistant to change and that this underlines the importance of a research action project being able to demonstrate the possibility of effective and productive change.

Because this methodology entails the involvement of several staff members in almost all stages of the research, a profound understanding of the problem in question, pioneering (out of the box) solutions and a wider acceptance of findings and recommendations are to be expected. Besides, it is well known that better objectivity and reliability can be obtained in a project's results if they are understood by the 'critical communities' likely to be most affected by organisational change before their application.

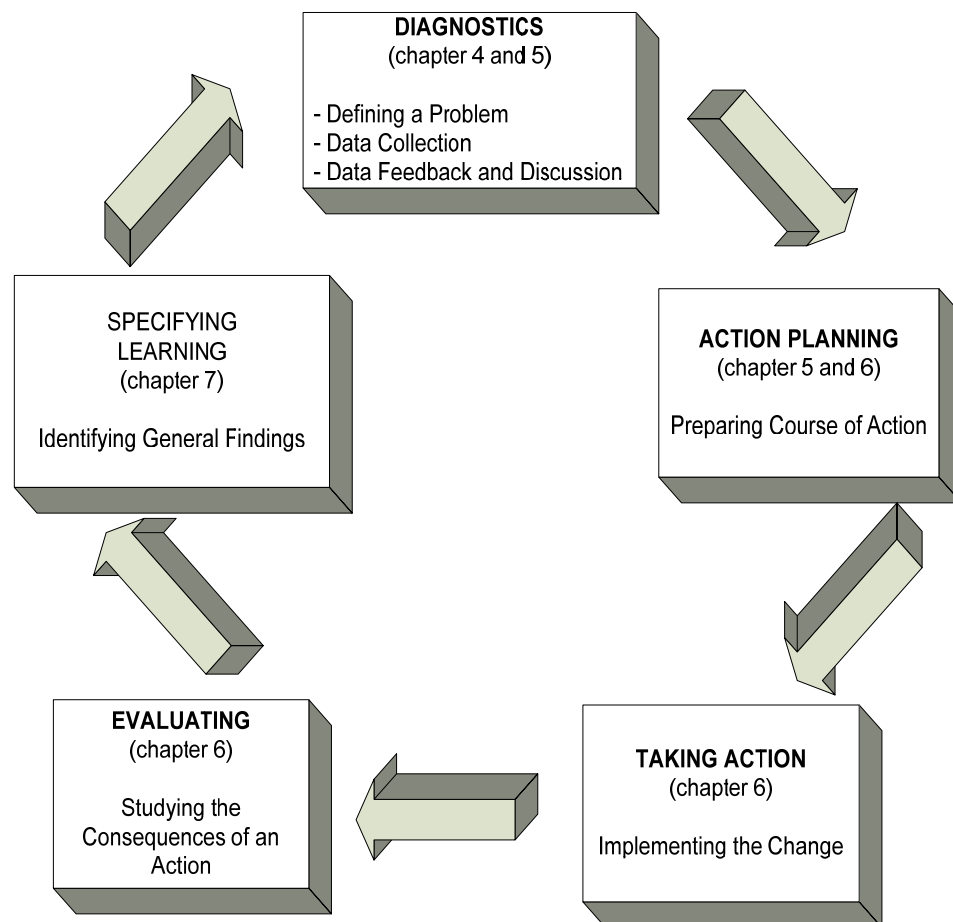
Although the need for change may be recognised, it may not result from dramatic changes in technology or the impact of external regulatory requirements. Quite often, as in the case of Marlow, organisational growth and increased administrative work volume may overwhelm existing structures and processes. In such a circumstance, in-house action research can be effective at two levels. Firstly, it may accurately identify the practical

measures required; secondly, it can smooth the path to implementation by involving affected staff in the necessary organisational changes.

In this project work, the Lewin-enhanced model of Gerald Susman (1983 cited in O'Brien, 2001:5) and Wilson (2000) is applied, which provides for five research phases which together constitute one research cycle. The five phases are as follows:

- Phase 1 (Diagnostics): A problem is identified and data is collected for a more detailed diagnosis.
- Phase 2 (Action Planning): Several possible solutions are considered, from which a single plan of action is established.
- Phase 3 (Taking Action): The solution/change is implemented.
- Phase 4 (Evaluating): The results are analysed in order to evaluate how successful the action has been.
- Phase 5 (Specifying Learning): The problem is re-examined and another cycle begins.

This process (the Lewinian spiral) continues until the problem is either resolved or maximally diminished (see Figure 1). Such a reflexive approach was highly relevant in the context of this research, which involved a live project where the researcher and his colleagues were all critically active subjects in the research and implementation of the results. Furthermore, it also had the advantage of allowing me, the research designer, to draw on the advice and assistance of an external consultant.

**Figure 1: Lewin Action Research Model<sup>1</sup>**

### **Phase 1 – Diagnostics**

The diagnostic phase of the research aims to identify, describe and evaluate the gap between the existing industry's HRM administrative system and the new system proposed in this study. In the initial stage, the research involved a comprehensive investigation of what had been the conventional crew management administrative practices through which third-party ship-management companies such as Marlow had developed their internal capacities to manage the shipping seagoing labour force since the 1980s. Chapter 4 examines the main role and functions of crew and ship management companies and conventional administrative procedures to inform the readers, especially those not conversant with the industry's environment, of the importance of the problems and associated parameters. A questionnaire survey was then conducted to collect data and

<sup>1</sup> Enhanced by Susman (1983) and adapted from Wilson (2000).

analyse them aiming to define the basic administrative problems. The analysis of the questionnaires is divided into two parts. The first part (Chapter 5, section 5.1) shows the results of the questionnaires' feedback in quantitative terms, while the second part (Chapter 5, section 5.2) assesses these results through focus group discussion (employees feedback and discussion) of the quantitative analysis, and indicates prospective adjustments to the administrative processes and work organisation.

### **Questionnaire Survey**

A questionnaire survey was undertaken to gather data related to the administrative productivity of Marlow Navigation and to the current state-of-the-art related IT applications; the results are presented in Chapter 5. Analysis of the results shows the functional areas where improvements and/or changes are necessary. The questionnaire was distributed in nine different sections of the organisation. The office has 340 employees and the sample of 78 respondents represented approximately a quarter of the total. The sectional organisation of the workforce into specialised functional groups meant that only a stratified sample could be used. A strict random sample could not be relied upon to deliver a sample of respondents that was representative of the organisation's division of labour. Therefore, a 'proportional distribution' of questionnaires was made to all nine functional sections involved in crewing activity; a minimum 20% response was received from each section which assures a representative and reliable sample.

The questionnaires were designed to collect data related to the degree of administrative efficiency and effectiveness regarding 'volume', 'time', 'costs', 'control' and 'quality'. The survey also provided first-hand information on how effectively the organisation was using the available information technology resources. With a view to achieving these goals and producing maximum input for the project, specialised questions were developed by the researcher and dispatched to the groups.

## **Limitations**

The general format and intrinsic nature of questionnaire design makes it difficult, indeed ultimately impossible, to develop questions that are able to exhaustively examine complex issues. Where fixed-choice questions are used, for example, the designer can never be completely confident that all possibilities offered are in fact exhaustive. There is a comparable problem where respondents are faced with questions that have to be rated with scores or ask for indications of preference from a list of statements. Where write-in options are offered, there are inevitably difficulties in handling this data quantitatively or qualitatively. These potential problems mean that except where the data sought is uncomplicated by questions of 'light and shade' the questionnaire survey method cannot be considered as a stand-alone research tool. It is for this reason that this project's research methodology includes a focus group discussion designed to analyse and provide detailed interpretations of the gathered questionnaire's results.

As it was difficult for the researcher to be present in all relevant sections of the Marlow administration it was impossible to know whether or not all respondents understood the questions properly. A detailed explanation of each question was therefore provided to all section heads, who then became responsible for discussing and clarifying possible questions raised within their groups. The researcher had to be confident that the questions asked meant the same to the respondents as they did to him. This is a problem that was - to some extent - modified by a preliminary consultation and discussion with a random group of potential respondents. Through this informal 'pilot survey' the researcher managed to get useful comments on the questions. Consequently, he was able to make the relevant adjustments, wording improvements and arrangement of questions into an effective sequence.

As was mentioned previously, in the real survey the researcher distributed the questionnaires to a carefully-designed and stratified sample that appropriately represented the target population. A proportional distribution' of questionnaires was made to all nine functional sections involved in crewing activity. Without any pressure or persuasion of any kind, a 100 per cent response rate was achieved. The overall sample represented 25

per cent of the total number of employees and was deemed to be a sufficient proportion to produce reliable data.

### **Quantitative Description of the Results**

Initially, descriptive statistics were used to present the results in a manageable form and a logical way. Collected data were organised and presented both individually (individual sections) and collectively (all sections) in order to arrive at conclusive results. These statistics serve as a means of finding order and meaning in the questionnaire responses, which in their raw state have no apparent order or meaning. Data were reduced to descriptive summaries (e.g., mode, average, max, min) and represented graphically. This method enabled the researcher to draw some first conclusions before negotiating organisational changes with the working community. The researcher basically attempted to provide an answer to the question '*What should be done next?*' The conclusive statistical information was then communicated to the organisational staff so that they were prepared for the focus group discussion.

### **Qualitative Analysis: Focus Group Discussion**

Focus groups are frequently seen as an important tool for acquiring participants' direct feedback regarding various topics. The main objective of using this instrument in the business context is to identify the administrative problems that an organisation confronts via a discussion in a group comprising the heads of the company's different sections and consequently to identify changes that should occur in working methods and practices. Historically, the use of focus groups was a response to what was often seen as an overreliance on quantitative techniques, as these were not always sensitive to subjective factors and not always reliably identifiable from aggregations of questionnaire responses. Focus group discussion provides survey participants with the opportunity to examine questionnaires' information and express their feelings, beliefs and opinions freely. Furthermore, they are able to amplify responses to the inevitably restrictive form of the survey responses. Given the fact that the quantitative results extracted from the questionnaire survey indicated a number of different employees and sections' preferences



and opinions, the methodology was especially well-suited to the aims of this project. More generally, the interaction among the participants was expected to stimulate new ideas and thinking, and to identify points of potential conflict that otherwise might not have been explored.

### **Focus Group Structure**

The meeting took place in the company's conference room (a neutral site) and lasted approximately two hours. The group consisted of the heads of the nine sections of Marlow Navigation, Mr Menelaou (the researcher-author and Marlow project manager) as moderator and an external consultant as an observer. The participants were selected by the moderator, who wanted to ensure that they had common interests and expectations of the subject of the discussion. They were all informed in advance of the aims of the focus group meeting. There were also a number of prior meetings in which the results of the questionnaire survey were presented and explained to them.

The role of the moderator was to facilitate rather than to guide the discussion. He encouraged the participation of everyone and sought to limit the normal tendency for discussion to be dominated by a few participants. During the discussion, the moderator asked prompting questions in order to elicit expansion on relevant subtopics.

The external consultant participated as a trained discussion observer to facilitate the process. He took notes of the conversation and overt statements and was sensitive to omissions and choice of words. His role was critical since, in the company's internal policy, no tape recording is allowed in any managerial formal or informal meeting. The final results derived from the focus group relied to a large extent on his written recording and conceptual understanding of the topics discussed. It should be noted that intensive informal meetings between the external consultant and section heads took place a couple of weeks after the focus group meeting. The relevant discussions took the form of a 'negotiation' process for decisions on the required organisational changes.

The final outcome of the focus group, as well as of the subsequent negotiations, was a report that included the main conclusions and recommendations for new IT instruments

and working processes -the changes- to be introduced; this was prepared jointly by the researcher and the external consultant (see evidence 1). The report provided the basis on which the researcher prepared the steps of the plan to be followed in the next phase.

## **Phase 2 – Action Planning**

Action planning is essentially the coding or conversion of previous discussions into a detailed analysis and description of changes to be made. In particular, the recommendations of the focus group were converted into a graphical chart describing the workflow model, including all new innovations and related working processes.

Several IT instruments were introduced, each of which constituted part of the proposed fully integrated crew management system. At this stage, main new IT instruments which were developed to provide solutions to the problems identified and to improve efficiency in the organisation were tested by a ‘controlled’ group. This is an important part of the process prior to the implementation task, aiming to provide an initial evaluation of the impact of various solutions/changes. At this stage, the researcher collects the results, examines possible alternative solutions and finally, based on a single plan, makes a decision about the implementation of the new system in a live environment. This preliminary process is executed in a test database environment and normally involves the identification of the so-called ‘first problems’. In this respect, the participation of Marlow employees was elicited in the form of a steering group in order to discuss, negotiate and find solutions for problems as they arose.

Once the innovations were thoroughly tested and the initial problems solved, the users could start building confidence in the changes. The project team then attempted to obtain comparative productivity measurements. For example, among several groups in the Accounts Section, one group was selected to use certain new key IT instruments in order to handle the checking, processing, controlling and payment of invoice documents. In this way, the productivity of each specific group was measured and compared with that using the previous IT instruments and related processes. It was at this point in the spiral of change that the desired and projected enhancement of productivity was assessed. As in most industries, labour productivity is generally defined as the ratio of a volume measure

of output, where output is the number of seafarers served/administrated, to a volume measure of input, where input is worked hours and number of people employed.

This stage allowed staff members to contribute to the research by being actively involved in the testing and evaluation of the new IT instruments and work processes. Since these employees usually operate in the front-line production, their daily work experience enables them to recognise possible difficulties and problems which the researcher could miss. Therefore, their suggestions were significant and indeed quite necessary in reducing the possibility of major operational as well as technical problems during the live implementation phase that followed.

### **Phase 3 – Taking Action: Implementing the Change**

During this research phase, the action plan was put into effect. My role as a researcher was to carefully monitor and record employees' feedback and the degree of their motivation and/or frustration as a result of the change. Because traditional working practices which were long established in the organisation were changed or even completely replaced, this task was quite difficult.

In this phase, Lewin's views on implementing small-scale social change were taken into account. Lewin believed that the readiness to accept change is strongly related to action and if people are active in decisions affecting them, they are more likely to adopt new ways. Lewin theorised a three-stage model of change that has come to be known as the unfreezing-change-refreeze model, and requires prior learning to be rejected and replaced. The theory suggests that: 1) in the first stage, employees will have to be motivated to change (e.g., 'unfreezing'); 2) in the second stage it is necessary to identify exactly what needs to be changed (e.g. 'change'); and 3) in the final stage, new behaviour becomes habitual, including the development of new a self-concept and identity and establishing new interpersonal relationships (e.g. 'refreeze'). The logic behind Lewin's theory was apparent in all phases of the project. Many working groups/people were involved in the analysis, as well as in the development and implementation process. This Lewin-inspired approach was adopted throughout the research with the expectation that resistance to change could be minimised by adopting computer mediated communications such as

internet and video conferences, allowing a larger number of employees to participate in the project.

#### **Phase 4 – Evaluation: Determine the Impact of Change**

Here, the main task was to compare the results accomplished through the implementation of the new Crew Management system—the new IT instruments and work process—and to determine the success or failure of the project.

In order to estimate and evaluate productivity in the performance of the new CRM system, an appropriate indicator was established based on the formula given below:

- **Total Productivity = Number of Seafarers Onboard / Number of Office Personnel**

This key indicator represents the ratio between the number of the office personnel (input/cost) and the number of seafarers onboard the vessels (output). The seafarers employed are considered the core element of the typical CRM service offered to ship owners; therefore, they justifiably constitute the main output of the formula. On the other hand, the office personnel and the use of available resources and technology are the two main components of input quantity. In order to arrive at a feasible productivity indicator, the input quantity is restricted to the number of office personnel, which was a relatively constant factor that remained during the implementation of the new system (the change). Used in this way, any increase or decrease in productivity allows the researcher to target and evaluate the use of resources and to some extent the performance of the components of the new system (working processes and IT instruments).

Through the authority of my post as project manager, I have access to Marlow Navigation's databank. Therefore, I was able to collect the relevant primary data; based on the formula above, I then completed and presented a statistical productivity analysis for the past 10 years. As a result, the impact of the new CRM system on administrative productivity is determined was quantified, providing strong evidence of its real performance and of the project's success.

The activity then involved an analysis of a number of qualitative factors, with special emphasis on the impact of the new system on cost control, accuracy of business transaction processing, managerial reporting and the sections' synergies. A thorough comparative investigation between the previous and current system was completed by the researcher to generate conclusive results; these represent the main subject of the last research phase.

### **Phase 5 – Specifying Learning**

The purpose of the last research phase was to specify the impact of 'change'. In this activity, the research outcomes are specified and the researcher decides whether the problem has been solved. If the problem is either wholly or partially unsolved, the process action research cycle continues until the expected results are produced. The final cycle should ensure the stabilisation of the new crew management system and its acceptance by the users. In addition, to carefully coordinate the functionality of the system, the company will also focus on educating and properly motivating employees concerning its specific features and benefits.

At this stage, some difficulties are expected to appear due to the inherent difficulty of measuring innovative developments. In response, the research includes two broad categories used to specify and measure the impact of the 'change':

- a. Outcome Measurement: This involves reporting how successfully the company is performing in the areas affected by the change. Such measures mainly include productivity levels, financial results and the impact on employees' work in the various administrative sections.
- b. System Measurement: Here, how well the company's new internal system is working is analysed. Such measurements include data processing performance (accuracy and speed) and comparison analysis. The latter analysis refers to the outcomes measurement comparison between the new CRM system and the previous one.

### 3.2 Main Research Questions

- *What are the main symptoms of low productivity in CRM office administrations?*

The initial analysis of the current industry crew management environment provided the platform for my research, which involves the identification and understanding of the major problems in carrying out the role and functions of a crew manager. The specific problems noted provide the direction for relevant changes in the business processes and the appropriate development of IT software/instruments that are primarily aimed at improving productivity.

- *How can tailor-made IT tools/applications and related business processes positively impact crew management administration?*

The research presents tailor-made IT tools/systems for crew management and explains their function and positive impact in crew management administrative operation (problem solving). Comparison of the old and new systems will also be presented to illustrate and justify the relevant advantages and benefits gained by the appropriate development and use of IT applications.

- *How can the current Marlow organisational structure be streamlined to increase labour productivity and operational efficiency?*

Once the proposed innovation/change is implemented, the possible need for reorganising the structure of the company and reengineering the relevant functions within sections is examined. Such a task emphasises the need for a successful alignment between the business goals and the innovative IT components and processes introduced into the organisation.

- *How can an innovation be better introduced to the owners/shareholders and staff members of a shipping organisation?*

The research will analyse the necessary steps in the implementation of 'change' in working culture, in the context of the shipping industry environment. Relevant post-implementation activities are also thoroughly analysed. Specifically,

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methods used to manage and minimise employee resistance to new working processes and ensure that they positively accept them, as well as new IT instruments/applications, will be explained. Moreover, monitoring and control tools for the implemented 'change' and its performance will be proposed.

### **3.3 Ethical and Legal Considerations**

It was a primary concern of the researcher that the introduction of process change should be able to produce an optimally beneficial outcome. The term 'optimally beneficial outcome' is defined as significant improvements in the company's administrative efficiency without detriment to the terms and conditions of staff employment. While this was a necessary condition of the conduct of the action research programme staff members also had to be guaranteed personal confidentiality and anonymity when completing questionnaires and participating in the focus groups. This level of complete confidentiality was maintained with consistency throughout the research and included informal discussions with senior management and other colleagues.

The application of what are universally understood to be the normal ethical standards in the conduct of social science research was not in any way problematic (i.e. that no harm should come to any subject) in the practice of this research project. This was because of the company's practice of transferring staff to other posts whenever existing posts become obsolete. In such cases, the Marlow policy is not to fire the employee but rather to transfer him or her to another position suitable to their skills and abilities. Diversifying human resources is indicative of a level of respect for human value and is at the core of Marlow human resource management policy.

The same principle underlies the author's choice in methodology (action participatory research). In cases where new technology or changes are to be utilized, the organisation's philosophy is to implement a learning-by-doing method, as opposed to implementing the new technology or other change as a top-down command. The employees become active participants in the trial period, and their opinions were valued. Regardless of the level or

rank of the employee, they were made to feel free to express their opinions by providing feedback regarding potential problems.

### **Questionnaires:**

In accordance with the above considerations, a number of ethical issues were considered in the questionnaire design process, where relevance had to be communicated to the participants. Some of these ethical issues were as follows:

- Initially, the researcher assured the Managing Director that the company's data was to be used strictly and solely for research purposes and in no way used for any other purposes.
- The participants were not requested to state their names in the questionnaire, and procedures for the collection of the results ensured that the questionnaires were answered anonymously.
- The questions in the questionnaire were vetted so that they were not offensive or inappropriate to the participant or to the organisation. Finally, participation via the questionnaires was voluntary and no employees have been disadvantaged in any way if they did not participate on the project.

### **Focus Group Discussion:**

A number of ethical and legal issues were considered in the conduct of focus group discussion and in the ensuing informal meetings between the researcher and the company's staff members.

- First, the researcher provided assurances that all accounting procedures introduced were in line with Generally Accepted Accounting Principles (GAAP) and met the local regulatory needs of all Marlow companies in the various countries.



- Secondly, the focus group discussion, as per relevant company policy, was not recorded in any mode. This allowed the participants to more freely express their opinion.
- Thirdly, the questions or comments raised by the moderator were vetted so that they were not offensive or inappropriate to any participants. The external consultant who participated in the discussion was particularly sensitive to omissions and choice of words.
- Finally, it was explained to all the employees that by improving administrative productivity and quality of work, the company would be at a position to operate and progress in the complex and highly competitive shipping environment. Consequently, all company members will be able to share benefits, such as job security, job satisfaction and career development, which could be derived from the company's progress and success. It was also emphasized to them that the company has never in the past set aside the interests of employees and that the new system would provide them with new challenging working tasks and duties.

### **3.4 My Role as Worker/Researcher**

My current position at Marlow Navigation is that of a project manager. My role and duties mainly involve the development and implementation of new IT applications and workflow processes for the efficient handling of crew management administrative work. The creation of computerised accounting tools and methods is one of the main areas of my expertise and interest. My previous working experience with Marlow comprises eight years in the crew operation section dealing with planning and recruitment activities, as well as five years in the accounting section, where I was in charge of accounts payable and cost controlling administration.

The role as project manager, along with my multidisciplinary working experience and relevant knowledge, offers the opportunity to obtain an in-depth understanding of the company's Management Information System (MIS) and other areas that are useful to this

project. My deep involvement in the establishment of a new international financial software system within Marlow has also given me the opportunity to thoroughly examine the whole structure and operation of Marlow's worldwide network of affiliated companies. This system is expected to cover the needs of several of the firm's companies in different countries. At this point, it has already been implemented and runs smoothly in the major crew management business units of Marlow Cyprus, Marlow Netherlands and Marcrew Germany.

The authority level for the position of project manager has been clearly defined by Company's top management. During this research work, in order to avoid being too close to the problem and thus relying too much on personal judgment or decisions, I collaborated frequently with 'remote viewers' of the problem such as external consultants, and requested their help and professional opinion. I have also thoroughly explained the benefits of this research to my colleagues and asked for their active participation and, consequently, have been able to elicit their support.

The dual role of worker/researcher enabled me to obtain a better understanding of the organisational activities, the sources of information and, most importantly, the main problems to be scrutinised in the research.

My academic and professional background (BSc in Accounting and MSc in International Transportation Management) provided a solid foundation for the undertaking of this study. In addition to a professional career of 17 years in various managerial posts within the shipping industry, I have been a lecturer in the Department of Maritime Studies at Frederick University since 1999. My teaching subjects include: Human Resources Management, Shipping Accounting and Economics. My appointment as a course supervisor in 2002 gave me the opportunity to become heavily involved in the development and administration of the BSc Degree in Maritime Studies and participate in a number of funded research projects, where I acquired some first-hand experience of research theory and practice. I have also had an article published that has been central to debates in the shipping industry concerned with flags of convenience.

## Chapter 4: Crew Management Operation

This chapter provides the background for the understanding of the essentials of crew management operation. It describes the main commercial parties that constitute the shipping human resources industry, locally, nationally, and internationally. Their role and main activities are explained in general terms in order to inform readers not conversant with shipping industry organizations. Moreover, it presents the process of crewing administration as it presently functions in most ship management companies. The chapter amplifies the introduction and analysis of the main research problems and associated parameters, which are the subjects of the chapters that follow.

### 4.1 The Commercial Players

#### 4.1.1 The Seafarer

The smallest units in the shipping industry's labor market are, of course, the seafarers themselves. Notwithstanding its title, crew management does not involve itself in managing crews considered as collective entities. Crews of merchant ships are not, as they are in warships, conceived by their managers/employers as teams to be considered and organized so as to maximize *collective* performance (Lane, 1990). 'Ship performance' is closely examined by ship owners and their ship managers, but only according to commercial criteria. Crews as organized by crew managers are aggregations of individual seafarers, where 'seafarers' are simply defined as persons who work aboard ship, whatever their rank and role in the shipboard division of labor so that, for example, a ship's cooks and captains are both 'seafarers.' It is a universal practice that cargo ships' crews consist of three sections: 'deck,' 'engineering,' and 'catering.' The total crew size varies with size, type, and age of ships. On average, the deck department is the largest, consisting in ocean-trading ships of captain, three navigating officers (chief officer/Mate, 2<sup>nd</sup> officer/mate, 3<sup>rd</sup> officer/mate), and six able/ordinary seamen. Engineering consists of four officers (chief, second, third, and electrician) and two ratings. Catering has a cook, assistant cook/boy, and a steward. Deep-sea ships may additionally carry several deck and engineer officer cadets. A considerable part of crew management is concerned with

assembling crews from different world regions to slot into the sections and roles of the division of labor (Lane, 1996; ILO, 2003).

Individual seafarers' role performance is systematically monitored, aiming to ensure that the relevant professional standards are maintained. It is for this purpose that appraisal reports of individual seafarers are regularly carried out, evaluated, and stored into the company's computerized administrative system. Seafarers' recruitment is executed on the basis of ship-owners' preference, the level of their qualification and experience, as well as on the basis of cost effectiveness. Senior officers, for example, might be recruited from relatively high wage countries, while junior officers and ratings might be found in low wage countries. When seafaring careers are advertised, the main attraction or selling points are commonly, job security, good pay, adventure, travel, and the marine environment. The emphasis varies with different countries and regional locations. For example, research in Germany in the 1970's showed that the main reasons for choosing a seafaring career were adventure, rapid promotion, male image, the integration in the shipboard team, and exemption from national service (Boehm, 1975). Comparable evidence came from research in the UK in the 1960s (Hill, 1972). These factors also seem to apply, for example, to Filipinos, who now account for close to one-third of the world's deep-sea seafaring labor force, although in their case dollar earning potential is perhaps the main incentive (Berger & Doriol, 2009; Amante, 2003). The number of seafarers in the global labor market (as reported in the BIMCO / ISF 2005 Manpower update) is 404,000 officers and 823,000 ratings, from which, at that time, 40% and 26%, respectively, come from OECD countries. The total seafaring base is thus estimated to be 1,227,000, with forecasts of further growth.

Generally, the seafarer's nationality is relevant to wage levels and duration of tours of duty. European senior officers normally have 3-4 month tours compared with Filipino ratings tours of between 9–12 months. A typical wage cost of a Master from the Philippines, India, or Russia is between \$4200 and \$6300, which is low in comparison to the wage cost of a Master from countries such as Germany, Denmark, or the UK, which is not less than \$9000. These variations are justified by ship owners on the grounds of wage levels and standards of living in seafarers' native countries. It should be noted, however, that except in deep recessionary phases of the business cycle the shipping industry has experienced a persistent tendency toward shortages of suitably trained and experienced

personnel. While shortages of skilled officers are well-documented, the industry has normally been more tolerant concerning acceptable standards for ratings. Accordingly, ratings appear to have been relatively abundant. In recent decades, the shortage of officers has been a consistent finding in all studies of the global seafarers' labor market (Ellis & Sampson, 2008; BIMCO/ISF, 2005; Winchester et al., 2006; Wu & Sampson, 2005).

In their attempts to secure an adequate supply of seafarers for their own fleet, large scale ship owning companies with in-house crew management departments have continued their long-standing investment programs invested in the development of training programs and facilities, mainly for the production of deck and engine officers. To the extent that their principals have agreed contracts, crew management companies are similarly engaged in training.

The numbers of seafarers required to crew the worlds ships has steadily increased. Despite the realization of economies of scale in some sectors of shipping, crew size overall has stabilized, with the result that the increasing numbers of ships have called for an increase in the labor force. At the same time, increasing international regulation of training and educational standards and increasing prosperity in the principal labor countries in Asia and Eastern Europe has led to officer shortages. Furthermore, relatively brief periods aside, the shipping industry has always experienced high levels of turnover, especially amongst its skilled workers (e.g. officers) (Hill, 1972). Hence, nowadays growing emphasis is placed on training.

#### **4.1.2 The Ship-Owner**

A ship owner is the person or company that holds the legal ownership of the vessel. The term "ship owner" may also mean someone who equips and provides a ship, usually for the delivering of cargo in return of a certain freight rate per ton or lump sum freight agreed with the cargo owner. For a ship owner, a vessel constitutes a major capital investment. He expects this investment to bring optimal returns; in other words, maximum revenues at minimal costs. Of course, the risks associated to the financial, commercial, social, environmental, and reputation aspects of buying a "wrong" ship could

have catastrophic consequences for the buyer. Therefore, prior to purchase, reliability and efficiency of ship's design are the most important considerations with the needs of the client as the next (Precious Associates Limited for OECD and MTC, 2003).

Data on the nationalities of ships' beneficial owners shows that 87% of numbers and 91% of the dwt of ships are owned by nationals of 25 countries, of which 13 are European. European nationals own 44% of world shipping by number and 45% by deadweight (dwt) (See Table 4.1).

**Table 1: Top Merchant Fleets (by dwt) of the World by Country of Owner<sup>2</sup>**

Country of Owner	Dry Bulk	Combi ned	Containership		Ro-Ro	Tank er	Gas Carrier	General Cargo	Total
			No.	TEU's <sup>3</sup>					
Greece	1,347	15	174	532,354	20	795	22	133	2,506
Japan	1,150	-	225	750,390	274	428	83	99	2,259
China P. R.	1,016	7	214	643,649	10	220	6	325	1,798
Germany	187	5	1,152	3,187,654	5	148	7	118	1,622
United States	203	4	52	127,834	69	301	17	38	684
Singapore	173	15	110	213,844	4	235	18	32	587
Norway	176	20	10	22,870	79	287	81	40	693
United Kingdom	158	-	68	198,810	19	167	46	42	500
South Korea	222	-	75	191,693	25	63	22	21	428
Taiwan	216	2	201	546,509	1	42	6	14	482
Denmark	41	-	191	815,007	22	102	18	11	385
Bermuda	5	9	2	3,480	-	79	-	2	97
India	105	1	3	5,607	-	103	17	10	239
Italy	79	1	19	55,287	55	153	10	17	334
Cyprus	90	1	50	93,497	6	86	-	26	259
Monaco	71	2	43	172,530	3	42	8	2	171
S. Arabia	-	-	-	-	4	64	-	4	72
Switzerland	26	-	173	584,559	3	13	3	24	242
Russia	73	-	21	29,891	-	102	2	24	222
Iran	52	-	11	30,748	-	35	1	27	126
Canada	97	1	22	103,704	1	50	1	5	177

<sup>2</sup> Number of Ships (2006)

<sup>3</sup> Twenty-foot equivalent unit is a measure used to describe the capacity of container transportation.

Country of Owner	Dry Bulk	Combi ned	Containership		Ro-Ro	Tank er	Gas Carrier	General Cargo	Total
			No.	TEU's <sup>3</sup>					
Turkey	144	2	26	30,246	11	45	-	21	249
U.A.E.	42	6	14	16,883	1	58	12	14	147
Malaysia	5	-	30	58,254	2	52	19	3	111
France	12	-	63	242,154	8	26	6	3	118

Source: US MARAD for vessels 10,000 dwt or greater (2008)

Four types of contractual agreements are available for the ship owner to negotiate into the shipping freight market:

- **The Voyage charter:** the ship owner contracts to transport a specific cargo in a specific ship from port A to port B for a fixed price per ton.
- **The Contract of affreightment:** the ship owner contracts to transport a series of cargo parcels (voyages) at a fixed price per ton for a period of time.
- **The Time Charter:** the ship owner contracts to hire the ship to the charterer for a period of time. The ship owner continues to pay the operating costs (e.g., the crew, maintenance, and equipment) and has the technical operation and navigation responsibility. He places the ship at the disposal of the charterer, for which the charterer pays a fee. The charterer manages the commercial operations and pays all voyage related expenses.
- **The Bare Boat Charter:** the ship owner, who in this case is often an investor or a financial institution, purchases the vessel and hires it out to the charterer for a period of time, usually ten to twenty years. The ship owner acts purely as an investor, without having crewing or any other operational responsibility.

The ship-owner in any commercial agreement has the responsibility to provide and constantly maintain a seaworthy ship, manned with suitable and experienced crew. This function may be performed by the ship owner's own organization, that is the traditional "in-house" approach to ship management, or it may be assigned to a third party specialist firm of ship managers. Otherwise, a ship-owner may take up part of the responsibility (e.g., Technical Management) and entrust the management of crew (Crew Management) to the specialist ship manager. Under all circumstances, the ship owner usually demands

a reliable overall service by the ship manager. Primarily, he wants to have an economical budget and, above all, to secure a cost control process that maintains its financial equation.

#### **4.1.3 The 3<sup>rd</sup> Party Ship Manager**

The 3<sup>rd</sup> party ship management company is a business entity which is given the responsibility by the ship owner to operate the vessel on an agreed payment of fee. It is considered as a separate cost center to the Profit and Loss account of the ship owner, which usually means that the ship manager and ship owner do not have any ownership relationship between them. It is said, however, that lack of any strong link between the ship owner and the manager is often considered a negative point to the relationship of the two.

Third party ship management is a relatively young area in the shipping industry considering the fact that the latter is one of the oldest industries in the world, dating back to before the time of Herodotus; who even stated that ‘while we have ships on the sea we shall always have a homeland.’

The role of the ship manager has become more complex through the years. It started during the economic recession in the eighties, when many shipping companies became bankrupt and, as a result, mortgage financial institutions unavoidably had to turn into the option to outsource the management of vessels to 3<sup>rd</sup> party ship managers. It then continued in the nineties with the increased industry regulatory pressure, while new investors entered the market with little knowledge of shipping and the shipping sectors continued to experience volatile cyclical freight and charter markets (Pestana, 2007).

As of the 1990's, the trend moved towards the development of larger 3<sup>rd</sup> party ship management organisations able to cope with the important changes, such as the ISM and ISPS code, and capable of reducing operational costs by better negotiating the purchase of goods and services from suppliers. In 2001, Acomarit and V.Ships, two of the world's leading ship management companies, announced their agreement to combine their respective organizations. Today, the new business entity, with a global network of more



than 60 offices, employs some 1,000 office personnel and manages a fleet of over 800 ships manned with nearly 28,000 seafarers.<sup>4</sup>

Nowadays, the highly competitive environment made ‘quality management’ appear as a main company policy and as key ‘selling point’ of 3<sup>rd</sup> party ship managers. Almost all of them have established procedures aiming at constantly improving the quality and standards of their services. The performance of the crew, as well as their office and onboard working procedures are systematically measured and assessed in order to identify the possible weaknesses of the service offered to the clients’ organisation. Some common Key Performance Indicators (KPI), which the ship managers developed to serve this purpose, cover the following areas:

- Safety and risk
- Cost control
- Crew retention rate
- Forecasting and planning
- Work quality
- The number and nature of customers’ complains
- Providing management actions at the right time

The main aim of the International Ship Managers Association (ISMA), established in 1991, later renamed INTERMANAGER<sup>5</sup>, is to provide and monitor a code of ship management standards. Today, INTERMANAGER represents ship managers worldwide, controlling a fleet of over 1,000 ships. It is estimated that, nowadays, there are over 10,000 vessels under third party management, with the biggest ship management centres being in Cyprus, Hong Kong, Singapore, Germany, and the USA. These countries offer a number of favourable conditions to attract the establishment of ship management

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<sup>4</sup> Under the agreement, V.Ships' parent company, Vlasov Services Corporation (VSC), has acquired the entire share capital of the Acomarit Group.

<sup>5</sup> The main aim of INTERMANAGER is to improve standards in ship management and achieve a more controllable ship management industry. It was drafted by practical ship managers, and based on the experience gained through their involvement in day to day ship management. The association represents the views of its members in international organizations, such as IMO and European Union, and associations such as Intertanko, Intercargo, and BIMCO.

operating activities that include, besides their strategic geographical location, a proper maritime infrastructure and significant tax incentives. Research conducted in 2005 by the Frederick Institute of Technology (C. Charakis, A. Menelaou et al., 2005) reported for the shipping companies which are members of the Cyprus Shipping Chamber (CSC) the following results:

1. Companies' fleet amounts to 2185 vessels
2. There is a company that manages only one (1) vessel, while the maximum number of vessels managed by a single company is 701
3. The average number of vessels per company is 68
4. The total number of employees working within these companies is 1610
5. There is a company with only 4 employees, while the maximum number of employees reported by a company is 248
6. The average number of employees per company is 50 and the median is 16

Choosing the right ship-manager is not an easy task, not because the ship-owner has limited choices, but because there are numerous companies offering ship management services from different locations worldwide. The issue here is also more to do with the main factors that influence the ship-owners' decision making. Some of the factors can be quantified basically on cost and other financial items, while others are less tangible and must be assessed on a quantitative judgmental basis (Willingale, 1998:19).

Different kinds of ship management contracts have been developed to cover the various particular needs of the different ships' operations. The ship owner may choose to assign one or more tasks to the ship manager, depending on the type of contract they have entered into.

*'SHIPMAN 98 provides the following optional management services: crewing, technical management, insurance, freight management, accounting chartering, sale or purchase, provisioning, bunkering and operations. SHIPMAN 98 is suitable for managers supplying crew on a limited agency basis. For a more comprehensive and extensive crew management agreement, BIMCO has created CREWMAN A, which is also on an agency or cost plus basis. When the manager*

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*supplies crew as principal or on a lump sum basis, BIMCO<sup>6</sup> has created CREWMAN B' (Pestana, 2007)*

It can be argued very strongly that traditional and relatively small ship owners are usually in charge of the management of their own vessels. In this case, we have the traditional ship owner who, at the same time, is a ship manager (in-house management). On the other hand, it goes without saying, that it is the ship-managers who have the most specialized skills to run vessels. Therefore, nowadays, mainly the larger ship-owning companies have become simply the providers of the funds for the purchase of a vessel, very much like the owners of any other form of real property. For this 'property' to perform well, an effective and efficient management is required, and it is through such good management that the vessel will survive the bad markets and flourish through good times. The manager's income is the fee earned for the provision of his services. The owner's financial success and return on his investment, on the other hand, is derived from the profitable trading of the vessel and the increase in asset value as the market improves.

#### **4.1.4 The 3<sup>rd</sup> Party Crew Manager**

Traditionally, the company that operated the ship was also carrying out the human resource function for the seagoing personnel. As mentioned earlier, during the last two decades the increased operating advantage of specialization and economies of scale have made this function, quite often, to be subcontracted to a 3<sup>rd</sup> party ship manager, who provides highly specialized crewing services. In such a case, the business entity that provides such services may also be called a 3<sup>rd</sup> party Crew Manager, who is actually the employer of the seafarers. For the purpose of this project, the ship-owners will be referred to as the 'clients' of Marlow Navigation.

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<sup>6</sup> BIMCO is an independent international shipping association, with a membership composed of ship owners, managers, brokers, agents and many other stakeholders with vested interests in the shipping industry. The association acts on behalf of its global membership to promote higher standards and greater harmony in regulatory matters. BIMCO is the world's principal organisation responsible for the development of maritime contracts and other related forms. It has been estimated that over three quarters of transactions within the shipping industry take place using BIMCO approved forms. One of the primary aims of BIMCO's documentary work is to produce charter parties, other shipping documents, and clauses.

The basic idea of Crew Resource Management (CRM) is based on the assumptions that error is inevitable as far as human factor is present and that organizations must train their personnel in the limitations or weaknesses of human performance. CRM can, therefore, be seen as a set of error countermeasures with three lines of defence - avoidance of error, trapping incipient errors before they are committed and finally mitigating the consequences of those errors which occur and are not trapped (Helmreich et al, 1999).

The main operating objective of CRM in the shipping industry is to select, recruit, and provide well trained and experienced crew according to national and international regulations. The various crewing elements comprise of many different tasks, some of which are crew selection, recruitment, training and monitoring their performance. The crew manager shall ensure that the crews employed are fit for the job they are assigned and always hold a medical certificate from a qualified medical doctor. Moreover, a process must be established to ensure that crews have a sufficient command in the English language, which enables them to properly perform their respective jobs. Lastly, support to crew to resolve operational incidents must be provided (Willingale, 1998:19). The contact to the seafarer is either via the manning agent or direct via the telephone.

Since the crewing cost takes the most significant proportion of the overall ship's running cost, it is considered essential for the crew manager to reduce it by employing efficient and cost-effective methods and practices in crew management operation. Section 4.3.2 describes the commonly used industry CRM practices and administrative processes, which this project puts under scrutiny of research.

#### **4.1.5 The Manning Agent**

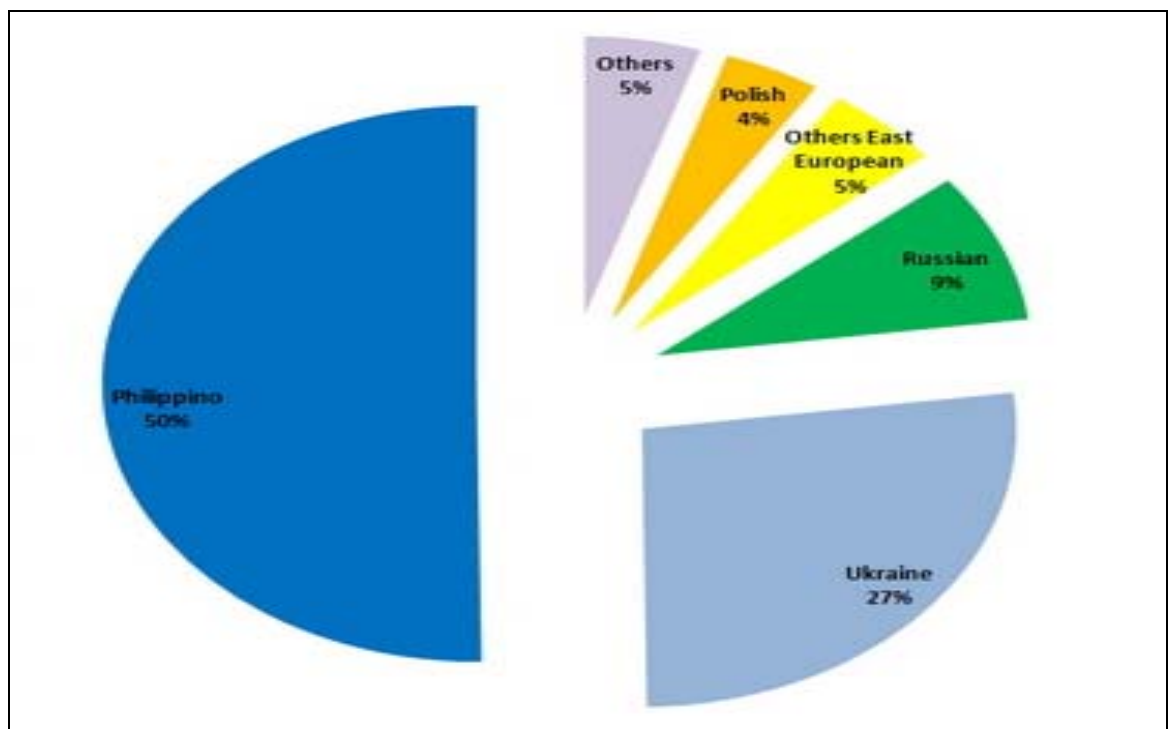
The manning agent is the intermediary between the employer and the seafarer. In their offices, they establish the first contact between the potential candidates that wish to start a seagoing career and the employer. The main role of a manning agent is to provide suitable candidates for the crew manager to employ. It normally keeps a database of potential candidates who have registered by email, letter, or personal visit to its office. The Agency will charge a rate, often called a "manning fee," for supplying seafarers on

the basis of the rank - officers, or ratings - and the basis of the period they are employed (Holt, 2008).

Manning agents screen the local labor market for potential candidates and undertake the pre-selection of them. They prepare them with visas and any other documentation needed in order that they are ready to travel to the port of embarkation. Furthermore, they keep contact between the seafarer and his family during his tour of duty on board, provide support with communication remittance, and deal with intelligence on matters concerning social and economic factors affecting seafarers. Among others, they also provide required support for seafarers' re-employment, promotion, and orientation courses.

The large ship management companies that are specialized in offering crew management services have today established their own exclusive manning agency offices in the main seafaring supplying countries, such as the Philippines, Russia, and Ukraine. Nearly all of the approximately 11,500 crew members employed by Marlow on board at any given time are recruited via its network of fully controlled offices (see Figure 2).

**Figure 2: Marlow Navigation- Crew Nationality**



(Source: Marlow Data Base, June 2010)

These offices are fully owned and controlled by Marlow, who aims to have good control over the recruitment process, related costs, and training of seafarers. Applicants and ex-crew alike are screened by expert former seafaring staff at these offices. This practice aims at ensuring that only qualified and properly STCW (Standards of Training, Certification and Watch keeping) certified crew join the pool of the company.

#### **4.1.6 Training Institutions**

Training facilities and educational institutions for seafarers can be found in the traditional seafaring countries and in the labor supplying countries. They can be divided into two main categories. There are the training centers that provide rather practical training, such as basic safety training for seamen and the academic institutions that provide more theoretical background for navigational and engineering officers.<sup>7</sup> The training schemes and the syllabi of the training facilities and educational institutions were different from country to country since they mostly followed national regulations. However, with the STCW convention, as amended in 1998, coming into force, the syllabi became internationally more and more harmonized.

The concept of training has also significantly changed. While before, training was mainly classroom based teaching of theoretical knowledge, nowadays, more emphasis is put on practical knowledge. Many training centres, and especially those owned and controlled by ship management companies, besides being equipped with simulators and other sophisticated professional equipment, operate workshops and seminars specialized to provide the students with basic hands-on knowledge. It is also worth mentioning that once they join a vessel, further training is provided to trainees-students by qualified and experienced crewmembers.

The funding of the facilities derives from different sources and varies between countries and companies. The facilities in labor supplying countries are often private enterprises,

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<sup>7</sup> In 2008, at the Hanseatic Marine Training School in Limassol, 118 trainees from the Philippines, Indonesia, and Myanmar attended the regular courses. Special courses were organized for 111 engine and deck officers and were attended by officers from the Philippines, Myanmar, Venezuela, Russia, and the Baltic Republics. Special courses on the use of life saving appliances and firefighting equipment were also organized for students of the HTI (Higher Technical Institute) and for Greek, English, Canadian, and Cypriot seafarers and the members of the Port and Marine Police. (DMS Cyprus, 2008)

funded by tuition fees of the students and support from the industry, whereas the facilities in the traditional seafaring countries of Northern Europe are mainly funded by governments with some aid and donations from the industry. For example, in Germany the students of the nautical facilities are not paying any tuition fees.

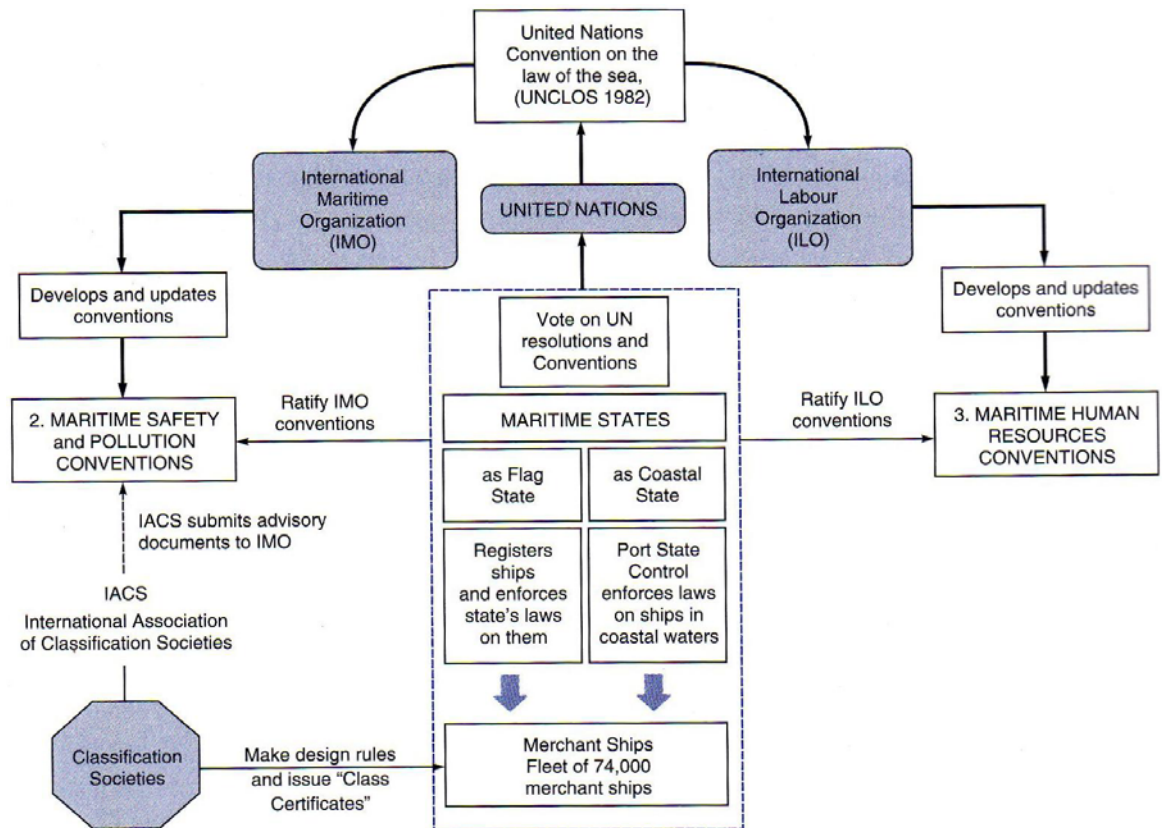
As earlier mentioned, in an effort to overcome the shortage of qualified and highly trained personnel, an increasing number of ship management companies have, during recent years, invested in their own training facilities and are now successfully running quite sophisticated in-house training centers in the main labor supplying countries. These centers are usually funded by donations from the ship owning companies (ship managers' clients), grants from governmental and private organizations, and, to the largest extent, by the ship management companies themselves. Participation in the training programs is normally free of charge.

#### **4.1.7 Relevant Regulatory Framework and Bodies**

All areas of the shipping sector are subject to a wide variety of laws and regulations, mainly aiming at maritime safety and human resources. This section provides a brief overview over the most important Organizations that determine the structure of maritime regulatory environment (see Figure 3). Moreover, the major maritime conventions which formulate the framework, within which the shipping industry operates, are described.

The **International Maritime Organization (IMO)** is a United Nations' Organization, dealing with safety and pollution prevention at sea. It was the first ever international organization concerned solely with maritime matters. Some of its most widely known (see Appendix 1) and recognized conventions are SOLAS (Convention for the Safety of Life at Sea), MARPOL (Convention for the Prevention of Pollution from Ships), COLREG (Convention on the International Regulations for Preventing Collisions at Sea), STCW (International Convention on Standards of Training, Certification and Watch keeping for Seafarers) and lately, the ISM Code (Management Code for the Safe Operation of Ships and Pollution Prevention), which came into force on December 1<sup>st</sup>, 1999.

Figure 3: The Maritime Regulatory Structure



Source: Martin Stopford 2007

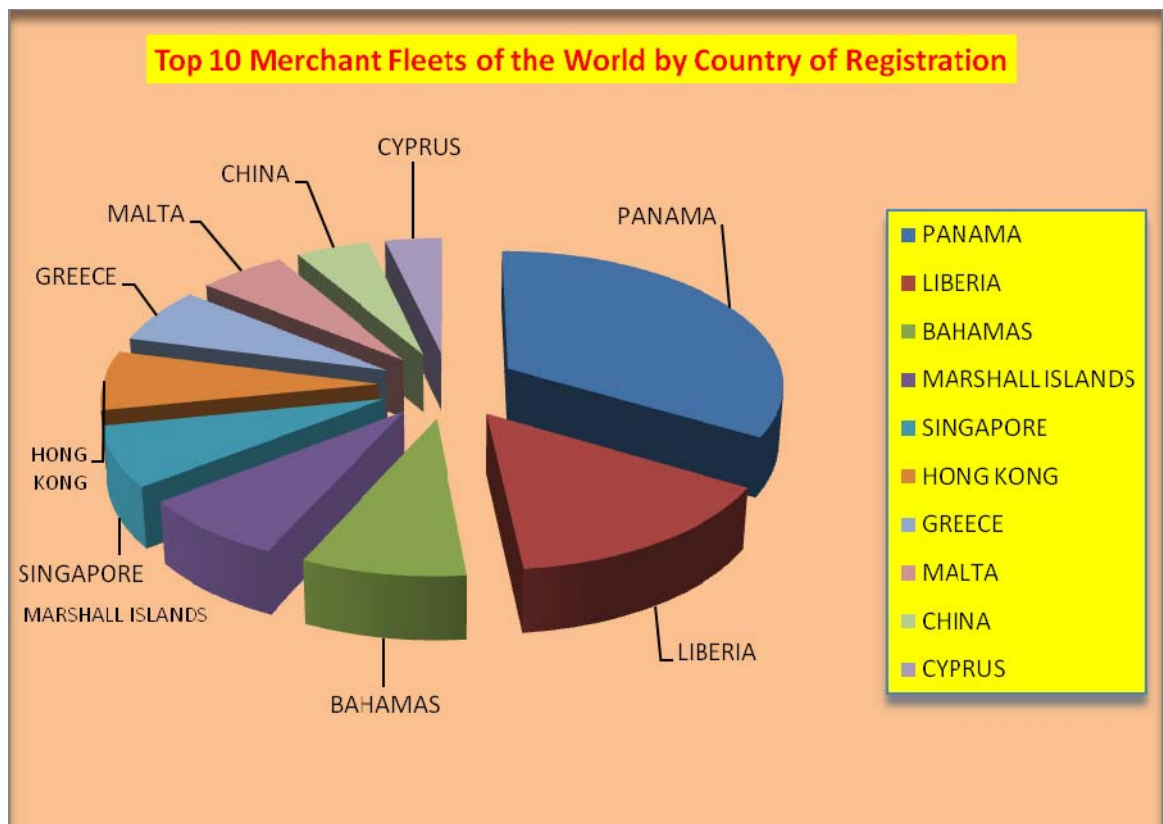
The **International Labor Organization (ILO)**, another United Nations organization, is concerned with the welfare of the seafarers. It deals with working and living conditions at sea, such as working and resting hours, minimum wages, pensions, vacation, and sick payment. It also sets minimum requirements for seafarers, like minimum age and necessary training and qualifications, and it gives rules concerning accommodation, food, and catering on board. Additionally, it regulates medical care on board and ashore, as well as health and safety protection and accident prevention.

The **Flag State** is the country in which the ship is registered and whose flag it flies. It is the primary legal authority and regulates all commercial and operational aspects of a vessel. For the registration and flying of the flag, the flag state collects a registration fee from the ship operators and an annual tax that depends on the vessel size (tonnage tax). In general, the shipping industry recognizes national flags and open registers (flags of



convenience). The term ‘flag of convenience’ is widely used in the industry to characterize administrations whose main interest is mainly on registration fee rather than on the operating quality and safety standard of the vessel. The flag state issues maritime regulations concerning safety and environmental protection and others, mainly ratifying IMO resolutions that the vessel under its flag has to follow. Monitoring is delegated to the classification society of the ship operator’s choice. Regarding seafarers, regulations concerning safety installations on board the ship and regulations concerning the safe manning and the seaman’s documentation are of most importance.

**Figure 4: Top 10 Merchant Fleets of the World by Country of Registration**



(Source: Statistics from Lloyd’s Register of Shipping)

**Port States** are the countries whose ports a vessel may call at during its voyage. As per UNCLOS 1982 (United Nations Convention on the Law of the Sea), they have the right to legislate for the “good conduct” of ships in their territorial waters, but are otherwise not allowed to interfere with them. Their main areas of legislation are the safety of navigation, protection of navigational aids, preservation of the environment, control of

pollution, and enforcement of customs and sanitary laws (Stopford, 2009). In an effort to standardize the rules for port state inspections and to achieve better co-operation, various countries signed memoranda of understanding (MOUs). The first one was the Paris MOU, created in 1982, which by now is signed by 27 countries. Later, the following MOUs were established:

- The Mediterranean MOU (10 countries)
- The Tokyo MOU (18 signatories)
- The Caribbean MOU (11 participants)
- The Latin American Agreement (12 countries)
- The Indian Ocean MOU (11 signatories)

Inspection results are shared between the co-operating countries, and usually are published on web pages, which are open to all signatories of a certain MOU.

The **Classification Societies** play an important role when it comes to the safety of vessels. They set technical standards for building and maintaining ships. In order to register and insure any vessel, it has to be classed. The various tasks of the classification societies comprise inspection of technical plans during the design phase of a new ship, surveys during the construction, and issuing of a certificate upon completion. Furthermore, periodic surveys are carried out at regular intervals to ensure the continued safety of all vessels in trade. Some of the big classification societies founded the IACS (the International Association of Classification Societies), an organization that aims at unifying technical standards and interpretation of international regulations. The IACS closely collaborates with the various classification societies, ship owners, and the ship building industry, as well as with government organizations. It is the only non-governmental organization that is accepted as an observer at the IMO, which even granted them consultative status thanks to the extraordinarily high technical expertise of its members.

The **International Transport Federation (ITF)** was founded in 1896, and since then represents transport workers worldwide and promotes their interests. Historically, the ITF leads the fight against flags of convenience mainly through boycott, a measure that kept

the ship blocked at its berth (Boisson, 1999: 438). The main policy-making body of the ITF is congress, which meets once every four years, and to which all affiliated trade unions can send voting delegates. The ITF has a consultative status at the IMO and forms an important group in the ILO.

The **International Shipping Federation (ISF)** was set up in London in 1909. It is an international employer's organization that is concerned mainly with industrial relations relating to working conditions and training of seafarers. ISF has a consultative status with the ILO and IMO, and coordinates and provides the viewpoint of employers.

The **International Maritime Employer's Committee (IMEC)** is the only international employers' organization dedicated to maritime industrial relations. As of 2006 IMEC became a Limited Company registered at Companies House in the United Kingdom. With offices in London and Manila, the organization, among others, also runs a cadet program in the Philippines which is dedicated to the long term supply of seafarers. In November 1999 IMEC and ITF signed the Constitution of the ITF/IMEC Joint Negotiation Forum. This inaugurated the first industry-wide collective bargaining system covering more than 100,000 seafarers of all nationalities serving on ships registered in countries designated by ITF as flags of convenience. It is globally unique. There are currently no other examples of international collective bargaining machinery.

Apart from the major Conventions, the ship management activity is also regulated from the taxation point (tonnage tax) of view under the European Union State aid policy. This is done by the "*Community Guidelines on State Aid to Maritime Transport*", originally adopted by the EU Commission in 1989, and revised in 1997 and 2004. In June 2009, the EU Commission adopted a *Communication providing guidance on State aid to ship management companies (2009/C 132/06)*. Cyprus has been very instrumental in the adoption of these new *2009 Guidelines* for ship managers (see appendix 2).

## 4.2 Crew Management Administrative Structure and Process

Considering the high cost involved in properly manning a vessel and the increasingly complex tasks related to the manning activities, as was mentioned before, it is no wonder that most ship owning and operating companies in the present cost-conscious environment outsource these to ship management companies. This section provides an overview of the basic processes that are applied in most shipping companies in order to carry out some of the major functions of crew management.

To facilitate understanding of the data flow through the various crew management activities, it is necessary to understand the general Marlow organizational structure, which consists of the following sections:

- Top Management
- Crew Operations
- Crew Travel
- Crew Insurance
- Crew Wages
- Crew Disbursement
- Financial
- Training
- IT
- Crew Accounts

**The Management Section's** main role comprises the function of sales and customer relations. The team of individuals in this section operates at the highest organizational level and directs organizational structure and strategy activities mainly related to size, diversity, growth, change, and innovation.

**Crew Operations Section** is usually divided into various operational groups of three to six employees each (one crew superintendent and a couple of assistants), who work independently under the supervision of the crew superintendent. Each group is

responsible for a certain number of vessels and clients. The crew operations section is mainly responsible for:

1. The selection of properly trained, certificated and experienced seafarers to take positions on vessels in accordance with legal and customer requirements
2. The organization of crew changes including visa and travel arrangements
3. The welfare of all seafarers whilst travelling and working for the company
4. The seafarers' performance evaluation and identification of training needs
5. The seafarers' career development plans

**The Crew Travel Section** provides flight bookings for the movement of seafarers on request, received normally from the crew operation section. Members of the crew travel section should find the most suitable flight option, considering both passenger's convenience as well as cost effectiveness. On a daily basis, they have to make sure that tickets are deposited in a timely fashion at the departure airport.

**The Crew Insurance Section** is responsible to arrange insurance for seafarers. On a daily basis, the members of the section deal with the administration of occupational accidents and illness-related incidents on board. Staff members are in touch with the Protection and Indemnity (P&I) clubs and their local representatives, who take care of seafarers in need of medical treatment and, if necessary, hospitalization.

**The Crew Wages Section** is responsible for the calculation and payment of seafarers' wages. This section deals with all issues related to wages, such as questions, complaints, or clarifications requested by seafarers. Due to the fact that different technology is used by the numerous clients of Marlow, integrated communication and interface of wages' data between their vessels and the office is not yet established. Therefore, administrative tasks related to crew wages are still organized and executed by the Crew Wages Section, and thereafter communicated to the vessels.

**The Crew Disbursement Section** (Accounts Payable) has a major cost controlling role in the organization. Here, incoming invoices from the various suppliers, such as the manning agents and port agents, are checked for correctness, posted to the ledger, and paid in due time.

**The Financial Section** (Sales) functions as the interface between the company and the clients (ship owners and/or ship managers). This section is in charge of negotiating contracts with the ship owners in regards to manning their vessels, and to issuing the respective invoices, including the fees of the services rented to them.

**The I.T. Section** is responsible to maintain and upgrade the company's information technology infrastructure, including hardware, software development, and computerized communication systems. The Section's main role is to constantly analyse present and future company requirements and technological developments in order to keep the company's IT infrastructure on top operational level.

**The Training Section** is in charge of the company's training activities. This includes the setting up of training facilities and the running of training programs according to the vessels' needs. Training centres are established and operated in the major seafaring supplying countries, such as the Philippines, Russia, and Ukraine.

**The Crew Accounts Section** has the overall responsibility for the recording of business transactions as well as for the reporting of financial results, which are derived out of crewing activities. Since the bulk of the volume of transactions is mainly generated by all other company's sections, an efficient computerized accounting process is nowadays becoming an obvious necessity. Innovative IT instruments and computerized accounting processes are among the main subjects which this project will be dealing with in the remaining chapters.

#### **4.2.1 Crew Recruitment and Planning**

**Recruitment** is the process of locating, identifying, and attracting qualified applicants for a specific job. The result is a pool of applicants, from where the appropriate candidate can be selected. Effective recruitment results in an organization hiring employees who are skilled, experienced, and adaptable to the general corporate working culture. Recruitment is almost central to any management process, and failure in recruitment can create difficulties for any company, including an adverse effect on its profitability. In addition, it can lead to labour shortages or problems in management decision making.

**Crew Planning** is the process of systematically reviewing Human Resource requirements to ensure that the required numbers of the employees with the required skills are available when and where they are needed. Human Resources planning aims to achieve the optimum use of HR and to have the appropriate number and types of employees needed to meet organizational objectives.

Management of shipping HR uses an efficiency factor for their activities' planning and organization with an important social dimension. First, it's well known that without seafarers onboard, the important contribution of shipping to the flow of international trade would not have been possible. Thus, it is essential to make sure that they are qualified enough to do their work under optimal working conditions and to keep them highly motivated. At the same time, crew efficiency is an important factor in a vessel's operational efficiency and profitability. Therefore, the challenge for crew planners is to maximize and sustain at good level both aspects. This is not an easy task, given the many uncertainties and peculiarities of the shipping industry. The main operational difficulty is the duration of "crew employment," which applies for short period of time. A month, few months, or a year at maximum are normal durations of the employment contracts, which mainly depends on the seafarer's nationality and rank as well as in some cases on individuals' preferences. Upon the expiration of the contract, there is no commitment (or at least legal obligation) either for the employee or for the employer to proceed with their professional relationship. Moreover, the availability of personnel, which depends on uncertain factors like illness, holidays, and career development does not allow for long-term planning.

In a Ship Management organization, organized crewing groups are in charge for the planning and selection of crew members. Prior to appointing any seafarer to join a vessel, the following pre-selection criteria must be examined:

- Legal requirements (flag state, national, ports called)
- Ship owner's requirements
- Ship's requirements
- Seafarers' requirements

### **Legal requirements**

The flag state issues a safe manning certificate for each vessel, in which it determines the number and necessary qualification of crew. Apart from this, there may also be restrictions to the nationality of crew, either from the flag state or from the ship owner's country of residence. Furthermore, certain ports called at during the voyage may have rather strict rules concerning visa and health and/or vaccination certificates.

### **Ship owner's requirements**

The ship owner normally has preferences as to the nationality of crew to be employed on board his vessels, which is very much correlated to what salary he is willing to pay. Additionally, the ship owner may have minimum requirements regarding the previous experience of officer ranks or regarding the length of the officers' onboard hand over period during a crew change.

### **Ship's requirements**

The crew has to be properly certified and experienced for different types of vessels, such as container vessels, heavy lift vessels, tankers, or general cargo ships, to name just a few. The type of engine and the specialized equipment on board have to be also considered while examining the relevant working experience of a seafarer.

### **Seafarer's requirements**

Finally, the seafarer himself has requirements and preferences that cannot be neglected. He certainly has some expectations when it comes to his salary and duration of contract. He usually determines the date when he will be available for his next employment. Finally, he also may have clear ideas about which vessels and/or owners' pools he is willing to join and which he will refuse.

It is of the utmost importance to strictly adhere to the safe manning of the vessel. Each position must be filled with adequately qualified personnel either by a suitable employee out of the existing crew pool, preferably crew who is already familiar with the vessel, or by a suitably qualified applicant. In that respect, the effect of recognizing and rewarding loyalty towards the company must also not be underestimated. It goes without saying that a crew management company will always try to retain and re-employ the highest number



of crew possible, as every lost crew member is also a loss of time and money, which had been invested in him. This goal is mainly achieved by offering attractive salaries and a satisfactory work environment, as well as by putting in place training and career development plans. Sea going crew retention rate is usually calculated based on the below formula:

$$\% \text{ Retention Rate (RR)} = 100 - \left[ \frac{(S - (UT + BT)) \times 100}{AE} \right]$$

Where:

RR = Retention Rate

S = Total Number of terminations from whatever cause (In effect, this means the total number employees that have left the company for whatever reason)

UT = Unavoidable Terminations (e.g., retirements or long term illness)

BT = Beneficial Terminations (e.g., sometimes those staff that do leave provide benefit to the company by virtue of leaving, for example under performers)

AE = The average number of employees working for the company during the same period as calculated (this should be any period of 12 months).<sup>8</sup>

#### 4.3.2 Crew Change Procedure

The Crew Superintendent is in charge for all seafarers employed on vessels assigned to his group, from the moment they leave their domicile to join a ship until they are safely back home. Among his tasks is to supervise the process of crew change, taking into consideration the visa requirements, travel arrangements, accommodation, and transfers, as well as onboard seafarers' overlap and communication. Consequently, the Crew Superintendent shall select a 'convenient' port for the crew change. At this point, it must be clearly understood that the term 'convenient port' nowadays does not necessarily describe a port where crew changes can be effected safely and cheaply, but often describes ports where visa and immigration formalities can be fulfilled swiftly and at reasonable costs. Therefore, while arranging a crew change, the following main parameters have to be kept in mind:

<sup>8</sup> <http://www.intertanko.com/upload/WeeklyNews/OfficerRetentionFormula.pdf>

- Visa and travel documentation
- Domestic travel
- International travel
- Information on travel itinerary
- Provision for rest before assuming duties
- Provision for overlap and familiarization
- Good and reliable initial response from local agent

Once the port is selected, the Crew Superintendent informs the Master about the upcoming crew change. The Master will provide the ETA (Estimated Time of Arrival) and, in the meantime, discuss and agree on issues related to seafarers' overlap and familiarization.

Then, the local agent is also informed about the planned crew change, who, in turn, provides the expected date and time of the vessel's berthing and the duration of stay in port. Consequently, the crew superintendent obtains flight quotations by the Travel Section, which he then checks for:

- Routing
- Connections
- Fare
- Type of airlines

Based on the above information, the Crew Superintendent chooses the most economic and convenient travel schedule. As soon as he received the relevant flight information, the Crew Superintendent informs the manning agent (who will inform the crew) or the crew (which is employed directly) about the ticket numbers and place where tickets are to be collected. Thereafter, he informs the vessel and local agent about all travel arrangements made. The port agent will provide the necessary assistance to the seafarers up until the onsigning crew safely embark the vessel and the offsigning crew safely depart from the nearest-to-the-port airport. Consequently, he will collect all expenses related to the crew change and invoice them to the Crew Management Company.

### 4.3.3 Crew Wages Functions

According to the terms set up in the contract of employment, each crew is entitled to receive monthly wages. The Crew Accounts section calculates the wages for each seafarer and, thereafter, prepares and sends the relevant pay-slips on board. Wages' balances calculation is completed based on the following information:

- Agreed wages as per contract of employment
- Allotments of the past month
- Cash payments through ship's cash box
- Cash advances prior to seafarer's employment
- Seafarers' Loans

**Allotment** is a partial wages' payment to the seafarer's personal or to his family members' bank account. It may be requested either as a 'continuous' allotment, which is normally executed at regular monthly intervals throughout the whole seafarer's employment time, or as a 'single' allotment which is executed only once and based on an ad hoc seafarer's request.

On a monthly basis, the master sends to the company a report named 'cash box statement', which indicates, among others, all **payments to the crew onboard**.

It is rather common for a seafarer to receive **cash advances ashore** during the time lag period between his employments. These advances are paid out by the manning agents only after they have been approved by the company's crew superintendent in charge. The manning agent reports to the company the payment date and amount, data which are then processed into the payroll system.

The seafarer may apply to the company for a **loan** only if exceptionally serious reason exists, such as medical expenses. The crew superintendent will evaluate the request and decide if the loan can be granted. A signed copy of the loan agreement is processed to the payroll system and the relevant installments are deducted from the seafarer's monthly wages account.

The increased administrative needs that are the outcome of the large volume of business transactions related to seafarers' wages calculation with related payments and other deductions items has led many companies to invest in highly technological payroll systems. Control, accuracy, and speed together with the capability to become integrated with other operational IT modules are some of the systems' main characteristics that Ship Managers are looking for in order to accomplish a productive administrative working process.

## Chapter 5: Questionnaire Survey

This chapter presents the results of a questionnaire survey that has been undertaken to gather data related to the administrative productivity of Marlow Navigation and to the current state-of-the art IT applications. The analysis of results shows the functional areas where improvements and/or changes are indicated. As Marlow is today one of the world's largest 3<sup>rd</sup> party Crew Management specialist companies, it may be considered as a suitable domain for research with organizational characteristics appropriate for a project designed appraise and then, as necessary, make adjustments to administrative processes.

The survey was explicitly intended to elicit staff participation in identifying process bottlenecks and then to involve staff in finding solutions. The end view was, of course, simultaneously increase staff commitment and thence productivity. As mentioned in Chapter 3 (Methodology), the questionnaire was distributed to seventy eight of Marlow's three hundred and forty employees, the whole workforce being organized in nine different sections of the organization. The sample of 78 was stratified to ensure that each section of the workforce was represented. A '**proportional distribution**' of questionnaires was made to all nine functional sections involved in crewing activity, out of which a 20% response was received by each and every section. As we shall see below, the survey data provided information that proved critical in evaluating the organization's use of information technology.

### 5.1 Overview of Methodology

The analysis of the questionnaires is basically subdivided into two parts:

The first part simply demonstrates the results of the questionnaires' feedback in quantitative terms. Descriptive statistics only were used to present quantitative analysis of the responses. The nature and extent of the data was not such as to justify tests of significance or any other more advanced statistical analysis. The data has taken account of results from individual sections and sections collectively. Each descriptive statistical

graph reduces data into a simpler summary. More specifically, taking into consideration the respondents' feedback, variables such as mode, average, max, and min have been reproduced and represented graphically.

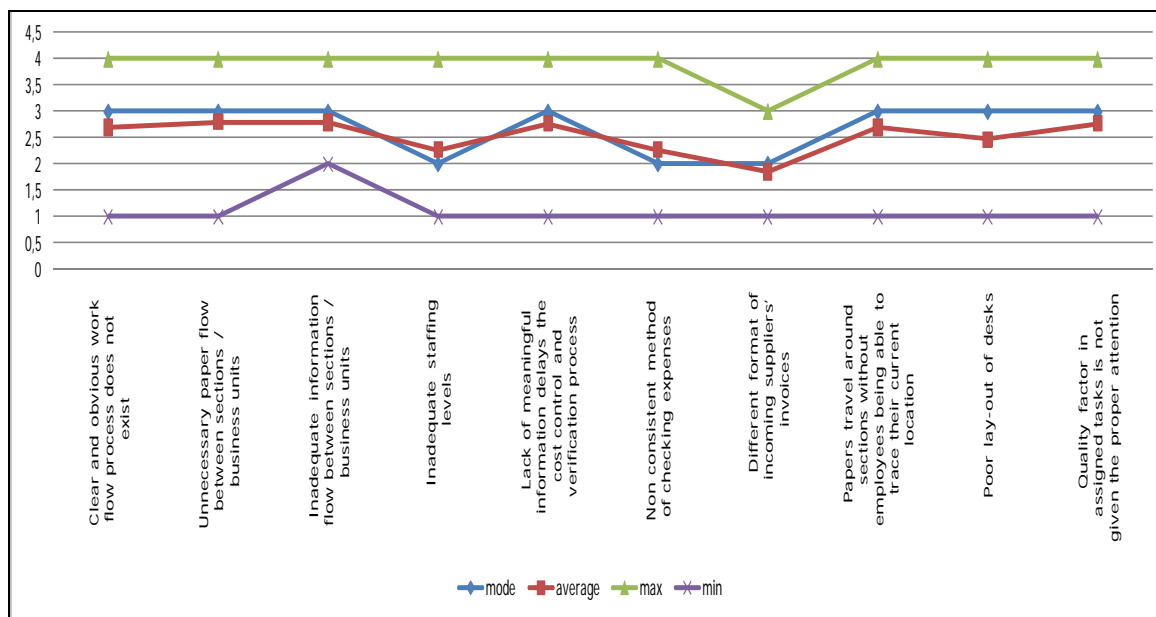
The second part of the analysis involves qualitative analysis of the focus group discussions. It aims at identifying the "Company's" administrative areas where changes must be effected and at the same time to set the necessary framework parameters for their implementation. Focus group discussions proved to be a valuable tool for acquiring employees' direct feedback regarding various topics of the organization. The purpose of the focus groups was to identify the administrative problems that the organization confronts via a discussion which is made by a group constituted by the heads of company's different sections and to propose the main characteristics of solutions.

## 5.2 Quantitative Analysis

### Question 1

**Here-below is a list of some of the most common symptoms of low productivity in office administrations. Please indicate up to maximum 5 symptoms if you only think that they apply to your section. Show the importance of each selected symptom by marking ( $\sqrt{\phantom{x}}$ ) a score between 1 and 4 where 1 = least important and 4 = most important (see appendix 3 – Questionnaire Survey).**

Based on the respondents' feedback illustrated in Figure 5, the most important symptom of low productivity in office administrations appears to be the "Unnecessary paper flow between sections / business units" with mode and average equal to 3 and 2.80, respectively. Then, "Inadequate information flow between sections / business units" follows very closely, with mode and average equal to 3 and 2.79. Finally, "Lack of meaningful information delays the cost control and verification process" and "Quality factor in assigned tasks is not given the proper attention" are also two symptoms that also contribute to low productivity with 3 and 2.77 and 3 and 2.76 mode and average, respectively.

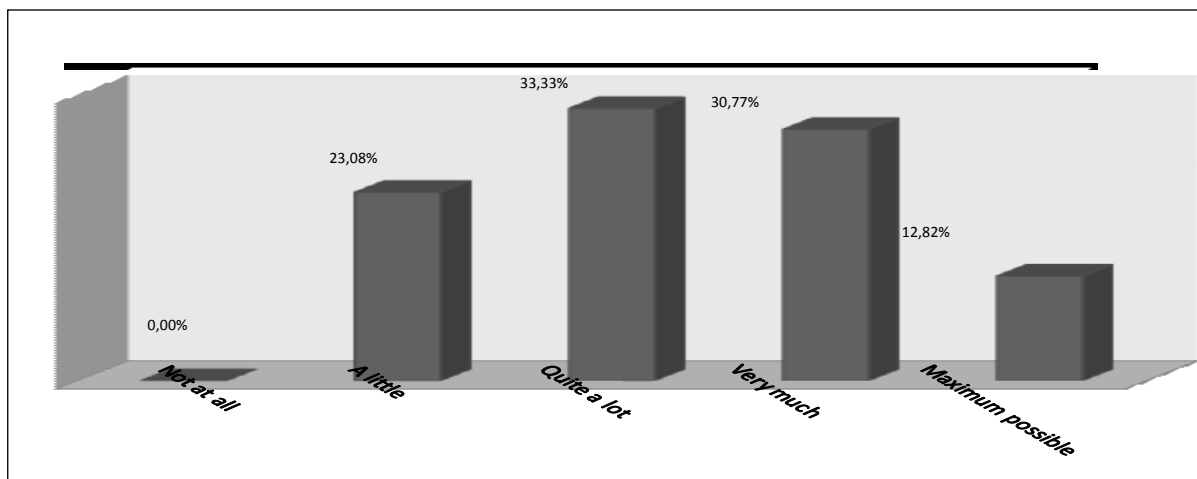
**Figure 5: Question 1 (Results of all sections)**

On the other hand, out of the employees' feedback, sections do not seem to suffer from "inadequate staffing levels", or "poor lay-out of desks." This suggests that the organization does not try to reduce costs in these areas. Similarly, "Non consistent methods of checking invoices" and "different format of suppliers' invoices" are considered by the employees as insignificant factors that do not impact on productivity.

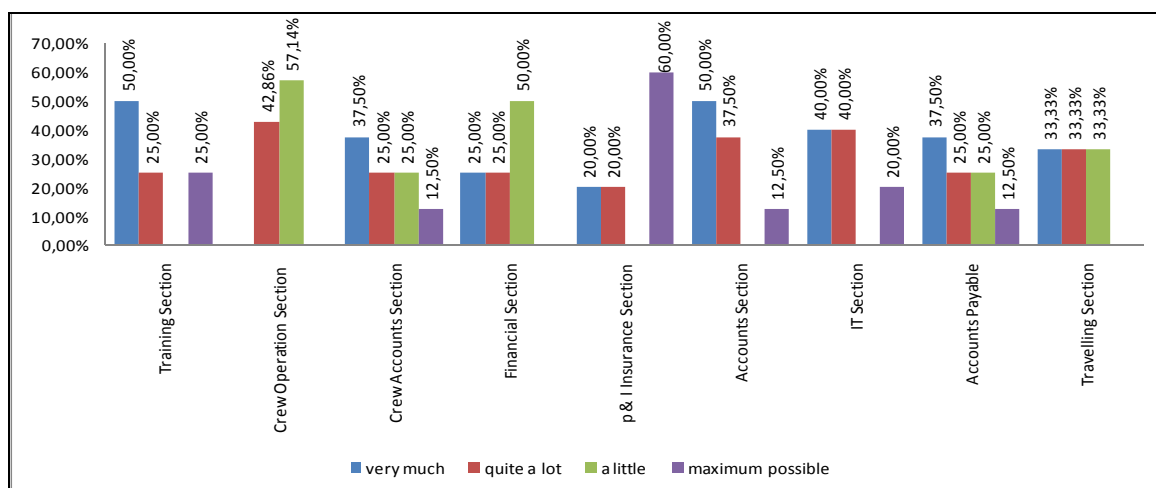
## Question 2

### How efficiently and effectively we are using available IT instruments?

Respondents were asked how efficiently and effectively available IT instruments are being used. The results in Figure 6 indicate that the majority of the employees believe that IT instruments are generally being utilized in a moderate degree. A 23.08% report that the organization benefits very little from available IT resources, whereas 33.33% and 30.77% believe that are being used "quite a lot" and "very much," respectively. Finally, no employee believes that they are used completely inefficiently and ineffectively, and 12.82% report that are used to the maximum possible level.

**Figure 6: Question 2 (Results of all sections)**

The results in Figure 7 indicate that employees of the “Crew Operation Section” and of the “Financial Section” are the most disappointed about the use of IT instruments. On the other hand, 60% of those of the Insurance Section believe that the use of IT is the maximum possible. Furthermore, the employees of the “IT section” (20%) and “Training Section” (25%) believe that the use of IT is the maximum possible, while no one believes that the use of IT instruments is inadequate.

**Figure 7: Question 2 (Results of individual sections)**

In general, the sections of Marlow Organization are to a moderate degree satisfied with IT use. Significantly different opinions exist in the various sections. This suggests that the IT infrastructure has not been developed in a harmonized way within the sections. It may also suggest that IT infrastructural needs vary with function in the overall administrative process.



**Question 3**

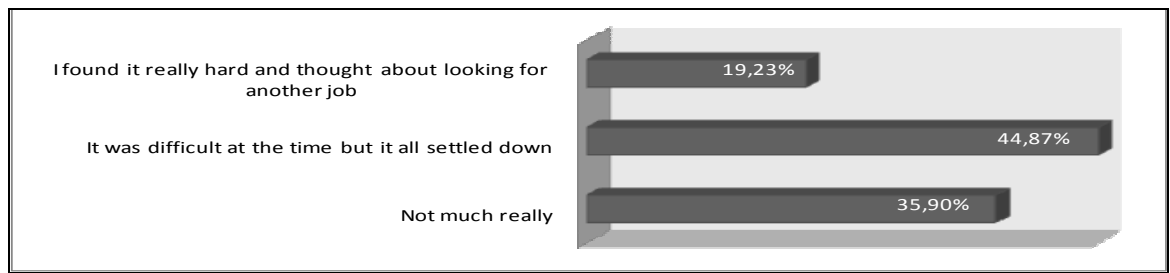
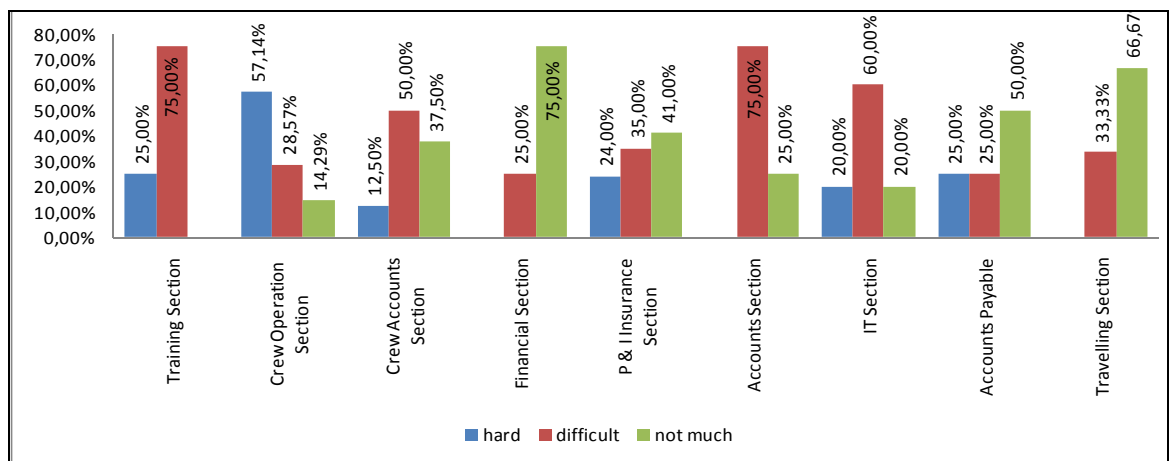
**Have you ever thought that your organization sometimes has a tendency to jump from one large project to another with no real sense of connectivity between them? If yes how disruptive of your work have you found this?**

Respondents were asked how disruptive the tendency of the organization to jump from one large project to another with no real sense of connectivity could be for them. Their answers are illustrated in Figure 8.

- 19.23% of the respondents found it really hard to deal with the tendency of the organization to jump from one large project to another, and even consider the option to change their job.
- 44.87% of respondents believe that this problem has existed in the past but now has improved.
- 35.90% of respondents have no real problem with the issue.

As far as the specific answer is concerned, “I found it really hard and thought about looking for another job,” it is remarkable that it has been adopted by the majority of the respondents of the Crew Operations Section (57.14%), which result is somehow quite worrying for the specific section. The same answer was given by 25% of Training and Accounts Payable Sections and by 24% of the P&I Section, which percentages give the picture of a more general problematic trend (see Figure 9).

In Figure 9, it is noticeable that the answer “It was difficult at the time but it all settled down” was given by the majority of respondents of the Training, Crew Accounts, Accounts, and IT Sections. 75% of the Training Section, 50% of the Crew Account Section, 75% of the Account Section, and 60% of the IT section believe that there was a strong tendency to jump from one project to another, but this status has recently changed. It is obvious from the results that the company has improved the methodology by which the various projects are developed by giving more employees the opportunity to participate in the relevant processes.

**Figure 8: Question 3 (Results of all sections)****Figure 9: Question 3 (Results of individual Sections)**

Overall, the results clearly indicate that almost all sections find it quite difficult to deal with the organization's tendency to jump from one project to another and strongly believe that better integration between them is necessary.

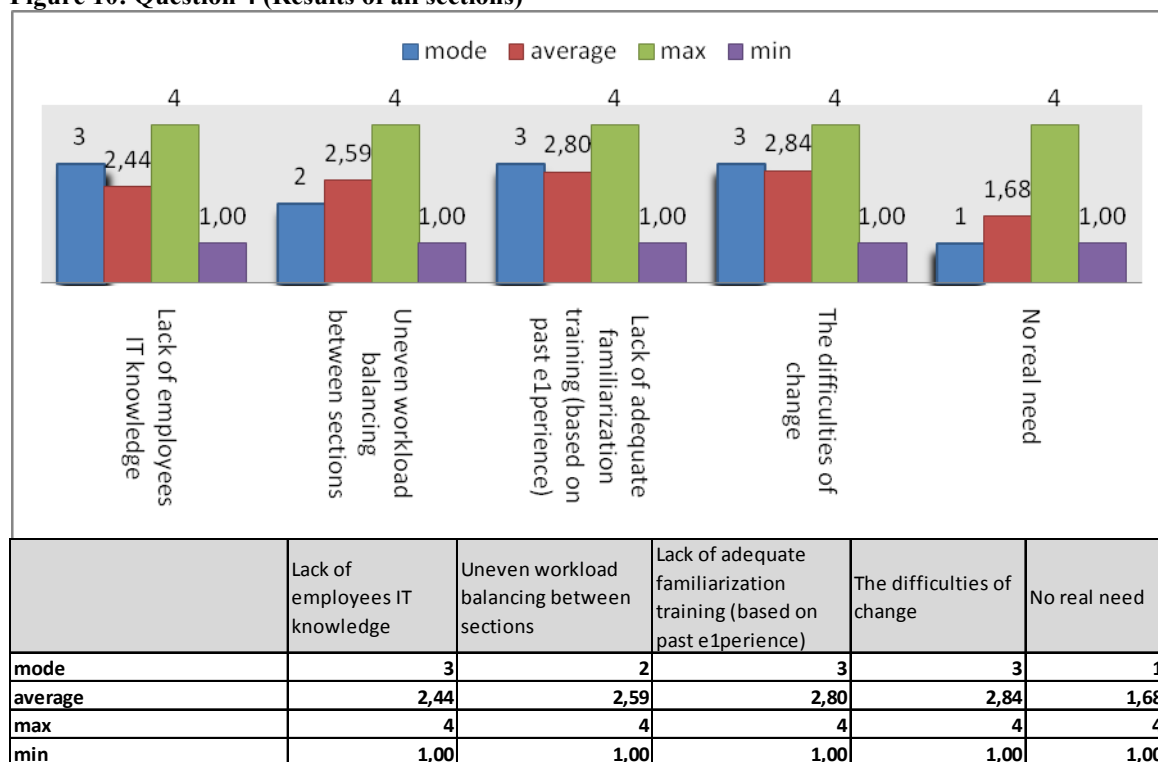
#### Question 4

Below is a short list of what are often regarded as the main reasons for reluctance to changes in existing IT methods / instruments. Show the importance of each reason by marking (✓) a score between 1 and 4 where 1 = least important and 4 = most important. If you think there is any other important reason, please say what it is in the space below and give its respective importance score.

Figure 10 indicates that 'difficulty of change', 'uneven workload balancing between sections', and 'lack of adequate familiarization training (based on past experience)' are the main reasons for reluctance to changes. It is obvious from the results (mode, average) that there is a similarity among the answers in respect to the importance of these specific reasons. More specifically, mode and average are ranging between two and four respectively; a fact which emphasizes that the problem of reluctance to changes generally

exists and consequently becomes an obstacle to the introduction of changes and to some extent to the development of the administrative infrastructure of the organization.

**Figure 10: Question 4 (Results of all sections)**



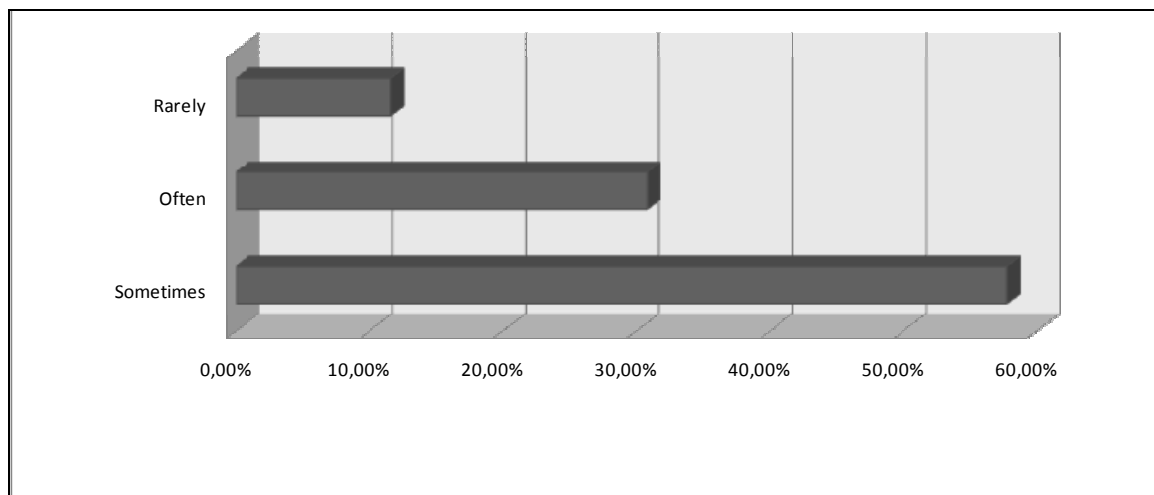
### Question 5

**Are you often distracted from a job in hand by being given additional tasks?**

Figure 11 reveals that 57.69% (45 respondents) of all answers answered “sometimes”, 30.77% (24 respondents) “often,” and 11.54% (9 respondents) “rarely.” It is quite worrying that the majority of the respondents has answered that they are sometimes distracted from a job in hand by being given additional tasks. This means that a lot of changes have to be done in order to improve effectiveness of each section. On the other hand, the sum of “sometimes” and “often” excels considerably the answer “rarely,” which is quite disappointing for Organization structure, and because of that the management section need pay take adequate attention to how to improve this condition and find the key aspects that are essential to being a successful and sustainable organization. Finally,

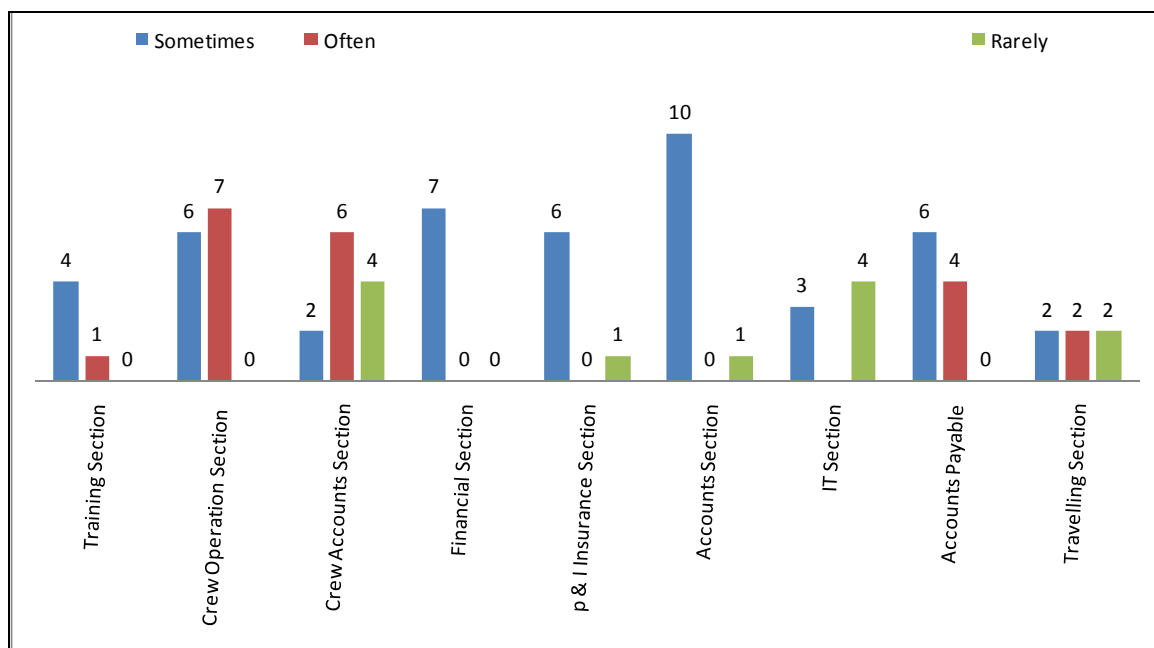
only the respondents of the IT section are rarely distracted from a job in hand by being given additional tasks.

**Figure 11: Question 5 (Results of all sections)**



	FREQUENCY	RELATIVE FREQUENCY	% RELATIVE FREQUENCY	CUMULATIVE FREQUENCY
Sometimes	45	0,58	57,69%	45
Often	24	0,31	30,77%	69
Rarely	9	0,12	11,54%	78
Total	78	1,00	100,00%	

**Figure 12: Question 5 (Results of Individual Section)**

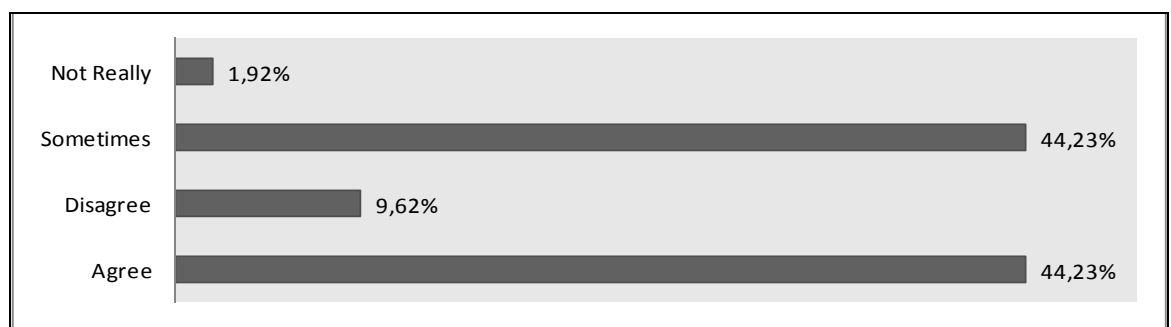


**Question 6**

**Do you believe that more Employees' participation at all levels of the organization in forming and revising policies and ideas will improve their results?**

The participants of the research were asked whether they believe that more employees' participation in forming and revising policies and ideas will improve their results. Figure 13 illustrates their answers.

**Figure 13: Question 6 (Results of all sections)**



In response to the question “Do you believe that more employees' participation at all levels of the organization in forming and revising policies and ideas will improve their results,” only 11.54% of the combined sample indicates that employees don't believe that the participation at all levels will improve the results, while the majority of the sample believes that there will be an improvement of policies' results.

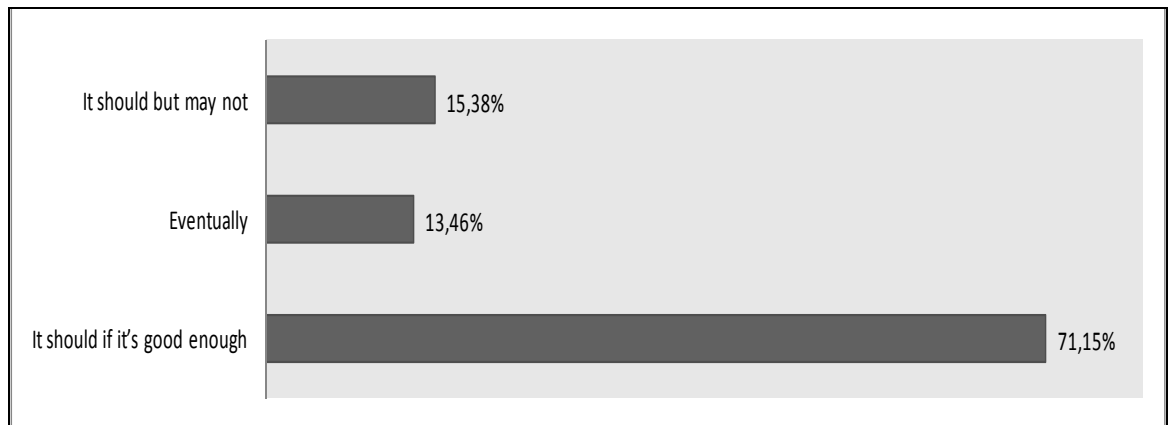
A significant percentage of the employees (44.23%) tend to believe that more participation of employees will only sometimes improve results in forming and revising policies and ideas. On the contrary, the same percentage of employees believes that more participation from their side will definitely improve results of new policies and ideas.

**Question 7**

**Do you believe staff training will improve the performance and productivity of your section?**

This question examines employee opinions about training as the basis to increase the sections' productivity and performance. The results are not very different throughout the various sections; therefore statistics are graphically presented only in a comprehensive format for all sections. Respondents perceive training as important only if it is well prepared and adequately specialized to the needs of the participants. Over three-quarter of the total employees (71.15%) marked the answer 'it should if it's good enough.' Just below one-third of those surveyed (15.38%) believe that 'it should but may not' and another 13.46% believe 'eventually' training will have some impact on the performance and productivity of their section.

**Figure 14: Question 7 (Result of All Sections)**

**5.3 Qualitative Analysis – Focus Group Discussion**

Based on the project's goals, this focus group discussion has been conducted, in order to investigate the crewing administrative function of a Ship Management Organization and to evaluate the effectiveness of used IT instruments and related working processes. More specifically, it aimed to diagnose the main problems of the administrative process, to

interpret the information gathered during the questionnaire survey (quantitative results) and consequently to propose the key parameters of respective solutions.

As described in Chapter 3 (Methodology), the meeting took place at the company's conference room (neutral site) and lasted approximately two hours. The group consisted of the heads of each nine sections of Marlow Organization, Mr. Menelaou (the researcher-author and Marlow Project Manager) as a moderator and an external consultant as an observer. The participants were selected by the moderator who wanted to ensure that they had common interests and expectations of the subject of the discussion.

### **Questionnaires' Results - Interpretation**

The group's aim initially has been oriented to the discussion of the main productivity related problems that have been extracted out the results of the first question of the distributed questionnaire. According to the analysis made by the group participants, the common symptoms of low productivity are separated into those of high importance-level and the rest of low importance-level. The results of high importance-level, which are those with high response rate, are found to be directly associated with the current in-house administrative process. For example, during the meeting it was concluded that the symptom of "inadequate information flow between sections" was most likely related to the use of the IT instruments and to inadequate coding and analysis of data.

On the other hand, "inadequate staffing," "different format of incoming suppliers' invoices," and "poor layout of desks" had concentrated low response rate, a fact that indicates that the level of productivity has limited connection with factors that are not directly associated with the company's administrative process itself. These symptoms are therefore categorized as of low importance-level.

Regarding the effectiveness and efficiency of operating IT instruments, the heads of each section have different opinions, which mean that some of them are satisfied with the current status and some of them are not. This conclusion shows that the development of IT programs in the company was not made in an integrated and harmonized way, but

based on individual sections' initiatives. This is an indication of **suboptimization**, which usually prevents a system from achieving its long term goals. The intense discussion that took place about this subject during the meeting required the intervention of the external consultant who emphasized that for a system to run successfully management should understand the interrelationships among all sections and the people working in them. He stated that disputes between individuals or sections for resources are self-destructive.

Finally, the heads of all "dissatisfied" sections expressed the opinion that the common project, which was already in progress and aimed at the development of an integrated administrative system, had provided positive attitudes and more confidence among employees about the effectiveness of the company's IT infrastructure. This conclusion goes in line and justifies the results of the third question, which emphasizes employees' opinions that the lack of connectivity and of rational integration between the different projects developed in the company was disruptive at the time, although it eventually settled down.

The discussion of last question's results shows that active members of an administrative environment are hesitant to attend training unless this is well prepared and tailor-made to their specific working needs. Almost all participants of the focus group meeting agreed that more specialization could offer prompt and practical benefits for them as employees as well as for the organization as a whole. One can presume from this result that the majority of employees within a service oriented business environment are not much concerned with their own professional development at a broader long term period, but they are more concerned to receive more specialized training and knowledge that can promptly improve their own performance as well as the functioning of their daily work.

### **Proposed Solutions**

All participants insisted on the development of an integrated administrative system, which must take advantage of available IT instruments, considers the peculiar needs, and facilitates the tasks of all company's sections. In other words, they wanted a system which can improve the efficiency by which the various tasks of the sections are carried out. The notion of efficiency, in general terms, can be expressed as the ratio between input and output; that is, the faster we can achieve our organizational objectives, the more efficient the process used for this purpose is (O'Sullivan & Sheffrin, 2003). In light of



this general demand, the focus group recommended some special and quite innovative solutions necessary for the fundamental system change, as follows:

**a. An Efficient Workflow**

Contrary to the traditional administrative approach of most ship management companies, the group decided that the crew operation section should no longer receive, check, and approve the company's incoming disbursements and invoices. It was suggested that this task, which was, until then, carried out by crew superintendents, be replaced by a simple and partly automated computerized coding of the initial 'purchasing order'. More specifically, once a seafarer is assigned to join a vessel, the crew superintendent should store vital information concerning the treatment of the cost and the activity involved into the system. Then, by the time the seafarer is processed into the system as a prospective member of the vessel's crew, a 'purchase order' is already activated. Consequently, this order will also produce certain variable costs, besides the relatively "fixed" cost of wages and insurance, mainly related to seafarer's travelling at a specific port. This type of financial information, which constitutes a well-recognized in-house computer-coded language, can be traced by the company's accountants once they receive suppliers' invoices, in turn, breaking down to the **unit of a single seafarer**. The invoices are therefore processed by the accountant, with no need to transfer the document to the crew operation section for prior checking and approval by crew superintendents.

The idea of this break-through process was presented to the meeting by the Head of the Accounts Payable (Disbursement) section, who was confident that not only would it minimize the cycle time but it would improve the accuracy of invoice processing as well. There was an initial negative response by the Head of the Crew Operation section, who argued that in cases where the crew superintendent did not physically receive invoice documentation adverse consequences on the effectiveness of cost control would follow. The discussion on this issue ended with a compromise. It was agreed that adequate testing of the new process should be carried out and the new process would not go live until the confidence and trust of the employees in the new process reached required levels. Additionally, at a post implementation stage, process control through an effective measurement system should be established to track quality and operational performance.

Finally, it should be noted that the majority of participants were positive about the proposed new process and data flow and were convinced that its implementation would significantly reduce the total workload of the superintendents, allowing them to focus more on client-oriented actions and crew performance matters.

#### **b. Custom-Made Journal Entry Module**

In line with the innovative process proposed by the Head of the Accounts Payable section, the group decided that **a custom made journal entry IT module** should be developed by in-house IT developers. This module should enable the accountants to efficiently retrieve data and to consequently transform them to ready-made accounting journal entries. More specifically, helpful links and business rules should be available through this **IT module**, which provide direct access to all cost related information initially generated by the crew superintendents. In addition to direct posting of invoices' business transactions to the general ledger, the module should facilitate an easy, prompt, and accurate verification of costs for the accountant. As a result, the flow of papers within the sections of the company is expected to be reduced significantly. Better cost control and improved managerial reporting are also then accomplished as outcomes of the detailed coding of cost to the unit of a single seafarer. The proposed design characteristics of the module were primarily aimed at the convenient processing of crewing business transactions on the basis of a single seafarer.

The introduction of this new IT instrument would allow staff members to acquire new knowledge and skills, which should make them feel more useful and keep them motivated. Moreover, their new and relatively extended roles would increase their job satisfaction due to the fact that they would have a greater level of autonomy, especially those working in the accounting section.

#### **c. Specialized In-House Training - Multidiscipline Knowledge**

The definition of Total Quality (TQ) recognizes learning and adaptation as the key factors to organizational success. Therefore, in line with the concept of TQ definition, the focus group decided that specialized in-house training should be prepared and provided to the employees to implement the new processes described above and to improve synergies among sections. It was specifically proposed that accountants' knowledge must be enhanced with the basics of crew operation functions. This will enable them to contend

with the volume of invoices and disbursements that relate to the thousands of seafarers' movements while joining and leaving ships with minimum need to contact other sections members. It's worth mentioning that the company, annually, reports a cost turnover related to approximately 20,000 embarking and 20,000 disembarking seafarers, which translates to an amount in excess of USD 200 million. On the other hand, crew superintendents who mainly have the general background of an ex seafarer (mainly Deck Officer), will need to obtain some basic knowledge of cost control and budgeting processes. They shall, thus, be able to create and monitor the transfer of financial information in an integrated computerized system, which is functioning within all organizational sections. At the end of the discussion, it is proposed by the focus group that Key Performance Indicators (KPI) are established, to monitor training results as well as the performance and development of each individual employee.

### **Conclusions:**

The main recorded conclusions of the focus group discussion are as follows:

- 1 In general, employees' view the main symptoms of low productivity are directly associated with the running of the current administrative process. Essentially, these are the following:
  - Unnecessary paper flow between sections/ business units
  - Inadequate information flow between sections/business units
  - Lack of meaningful information delays the cost control and verification process
  - Quality factor in assigned tasks is not given the proper attention
- 2 The development of IT in the company was not made in an integrated and harmonized way. It was spatial and based on specific sections' initiatives and, as a result, there was divergence between the sections of Marlow Organization and the use of IT programs.

- 
- 3 Employees believe that the various sections' administrative projects are better coordinated and functionally connected since the implementation of the core "integrated HR system" a year ago, prior to the questionnaires' distribution.
  - 4 More employees' participation at all levels of the organization in forming and revising policies and ideas improves their results. It also elicits their acceptance of new IT developments and innovative working processes.
  - 5 Active members of an administrative environment are hesitant to attend training unless the training is well prepared and tailor-made to their daily working needs. A specialized training offers prompt and practical outcomes to them and to the organization as a whole.
  - 6 The usual journal entry screen can be reformed and developed as a central source of information enhanced with links, business rules, and other functions. These new characteristics will enable the accountant to handle invoices, disbursements, and other documents more efficiently and to provide improved management reports.
  - 7 Employees' multidiscipline knowledge will enhance traditional ship management working processes and will provide the opportunity to introduce new organizational systems and/or structures that can improve the efficiency by which the various administrative tasks are carried out. In that respect, in-house specialized training should be developed and offered to the employees.

## **Chapter 6: An Integrated System of Crew Management**

Modern management is characterized effectively by two approaches, the systems approach and the contingency approach. The systems approach views the organization as a one total system comprised of interacting subsystems, all of which are in complex interaction with the relevant external environment (Lerman & Turner, 1992 cited in Waldron et al, 1997). Organizations are seen as ‘input-transformation-output systems’ that compete for resources. The survival and prosperity of an organization depend on effective adaptation to the environment, which means identifying a good strategy for marketing its outputs (products and services), obtaining necessary resources, and dealing with external threats. The contingency approach believes that it is impossible to select one way of managing that works best in all situations, as promoted by Lerman and Turner. This approach seeks to apply to real life situations ideas drawn from various schools of management thought and claims that no one approach is universally applicable, and different problems and situations require different approaches. Managers must try to find the approach that is the most suitable for them in a given situation, so they can achieve their goals. While this approach does emphasize contingency, it neither sets aside nor ignores the need for managers to examine the relationship between the internal and external environment of an organization. Nevertheless, survival and prosperity also greatly depend on the efficiency of the various and necessarily continuously reviewed “transformation” process used by the organization to produce its goods and services, on worker motivation, and on cooperation. Efficiency of the transformation process is increased by finding more rational ways to organize and perform the work and by deciding how to make the best use of available technology, resources, and personnel.

Through questionnaire survey and focus group discussion, the Marlow crew administrative environment, as well as the efficiency and effectiveness of the IT instruments and working processes used, are analysed here. The results of this analysis focus on the identification of contractors’ use of information technology and stimulates an “Integration System of CRM” at all levels of the organization.

*‘An **Integration System Management** is a discipline that combines processes and procedures from systems engineering, systems management, and product development for the purpose of developing large-scale complex systems. These complex systems involve hardware and software and may be based on existing or legacy systems coupled with new requirements to add significant added functionality’ (‘McGraw-Hill Dictionary of Scientific and Technical Terms’, 2003).*

In simple words, **System Integration** brings together many disparate systems and their processes under one unified system. It is a business development, including not only the core IT-systems of an organization but also its knowledge workers, customers, and suppliers. When different systems and applications are connected, it results in faster communication and higher security in internal and external processes (‘e-man’).

Over the past decade, Marlow has invested significant efforts and money in order to develop and finally establish an integrated CRM system, which aims at synchronizing and connecting together the activities in the various sections of the office administration. This system, which is based on the key parameters set in the focus group discussion, as explained in Chapter 4, is created to improve the **efficiency** by which the large volume of data is processed into the system and the **effectiveness** with which the various organizational goals are accomplished. Hence, efficiency is defined as the ratio of resources utilized against the results derived, and effectiveness may be defined as the degree to which a goal is achieved. The following sections provide a thorough description of the major functions and characteristics of this new system, as well as an analysis of its main advantages and benefits.

## **6.1 Process and Data Flow Reengineering - Analysis**

A definition of the term ‘reengineering’ that is particularly fitted to the main purpose of this project is found in James Evans’ *‘Total Quality – Management, Organization and Strategy, 2005’*:

*“Reengineering (also known as process redesign) is focused on ‘break-through’ improvements to dramatically improve the quality and speed of work and to reduce its cost by fundamentally changing the processes by which work gets done”*

An effective process aims to reduce waste of time, money, material, effort, and customer good will. Although every process redesign is unique, the basic principles<sup>9</sup> of redesign include:

- 1. Reduce handoffs.** Every time a process is handed from one person or section to another, errors can occur. As a result of an error, a chain reaction of delays and problems can also occur. Time is often wasted as one person waits for the other to finish or needs to consult with the first section before continuing.
- 2. Eliminate steps.** Steps that do not add value to the production of services should be eliminated. This will save time and thus improve the efficiency of the process.
- 3. Perform steps in parallel rather than in sequence.** Unless one operation cannot be done until another is finished, why not do them both at once?
- 4. Involve key people early.** The point is to avoid doing things over when key people do not participate in the development of the process. Consulting and involving key people from the early design stage of the process will limit the need for changes at a later stage.

It is estimated that through the company’s business activities approximately two million bookkeeping transactions are produced annually. These are mainly the outcome of approximately sixty thousand incoming invoices (purchase transactions) and thirty five thousand outgoing invoices (sales transactions) which are processed into the financial software systems on a daily basis. After passing through the company’s various sections, all these documents are finally stored into the financial ledger in the form of journal entries. Consequently, improved administrative productivity is to be achieved if the intermediary period, from the time the documents are received or being produced until

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<sup>9</sup> These principles are based on Richard C. Whiteley, *The Customer-Driven Company: Moving from talk to Action*. Reading, Mass: Addison-Wesley, 1991

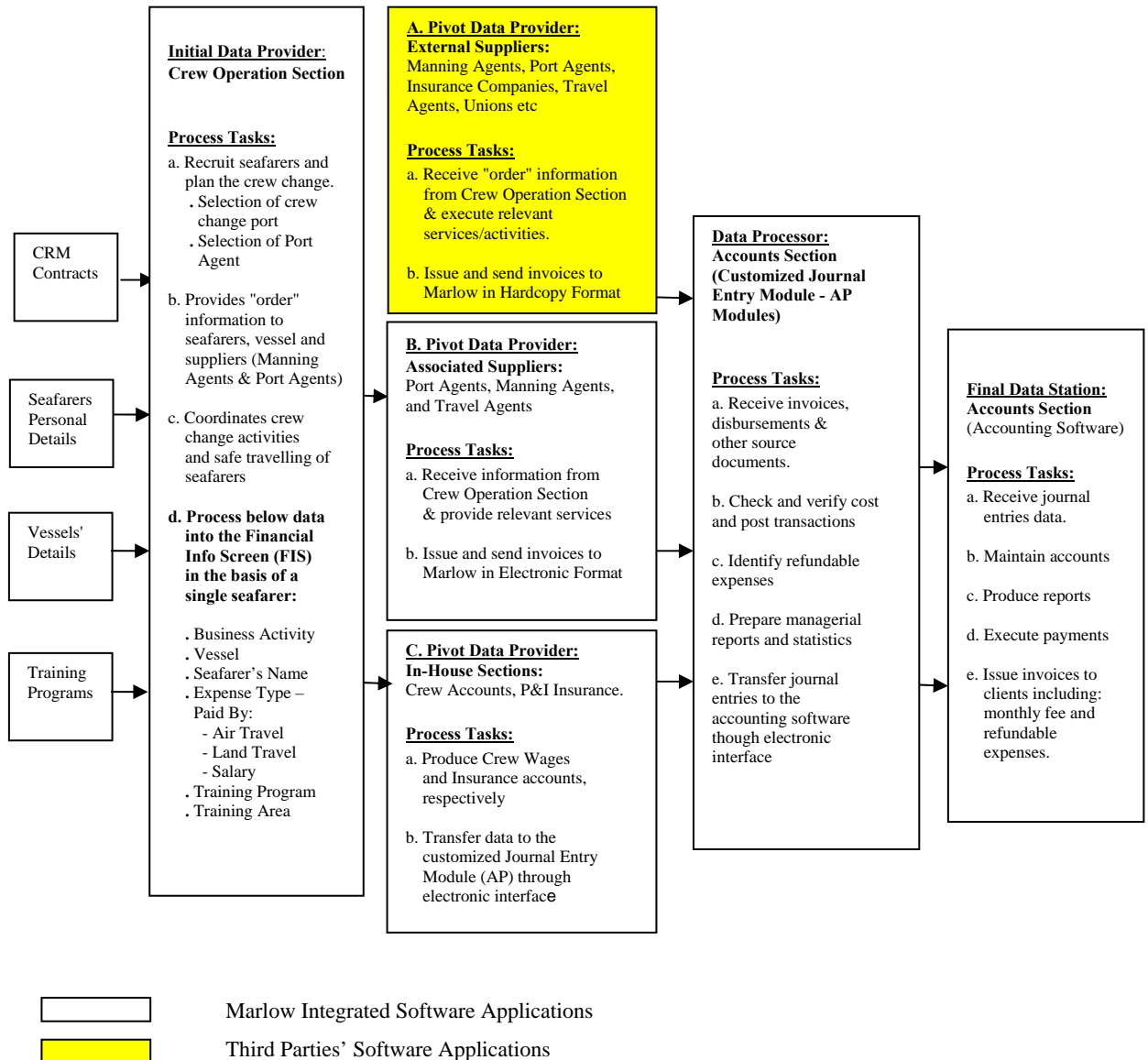
they are finally stored into the ledger, is minimized. This reduction in time can only be reduced by streamlining and simplifying processes to eliminate unnecessary paper flow and non-value-added steps. It is not a coincidence that the main symptom of low productivity, as indicated by the questionnaire survey, is found to be unnecessary paper flow within sections. In the employees' view, the major delay which occurs in the processing of business transactions is an outcome of inefficient in-house flow and handling of documents.

Figure 15 illustrates the new Marlow CRM system which aims at combining together available IT mechanisms, programs, and employees' process tasks in order to achieve their maximum integration and synergies. The system is characterized by its one-way data flow direction, avoiding any cyclical movements thus achieving almost optimal efficiency in the handling of documents and processing of business transactions. It was initially implemented in 2005, and since then, has been constantly enhanced with post implementation improvements and additions in line with the qualitative and quantitative findings of the questionnaire survey.

In order to progressively solve all the system's problems and deficiencies, the researchers (the company's project management team) followed the core steps of the action research cycle process, which provides for a systematic study and evaluation of employees' working practices and of the effectiveness and efficiency of the used IT instruments. The fact that many key employees participated in the development and implementation of all new IT applications as well as in the setting of related working process minimized the expected resistance to change. To this effect, computer mediated communications, such as internet and video conferences, were used in order to broaden employees' participation to the project. The successful integration of all inputs in the production of administrative service proved to be the key factor in the project's success. The peculiar characteristics of the new system are described in the following sections of this chapter.



Figure 15: Marlow CRM System – Information and Business Process Flow Chart



### 6.1.1 Initial Coding on the Basis of a Single Seafarer

The Crew Superintendent, acting as **Initial Data Provider**, stores financial data related to the operational tasks of the employment and movement of seafarers into the system. As indicated in the main recommendations of the focus group, data are generated and maintained in the database in a well-recognized language, which can later on in a final stage be easily transformed to bookkeeping journal entries on the unit basis of a single seafarer. Additionally, other broader cost centres are established, such as the business activity and the vessel's name, which provide the system users with the capability to extract useful managerial reports. More specifically, once the crew planning process is completed, information on the basis of one "order" per seafarer, embarking and/or disembarking, is made available to the computerized system. A simple screen, called "Financial Info" (FIS) (see Figure 16 – p. 99) has been developed in-house for this purpose, which includes the following data fields:

- **Name of the Vessel (VESSEL):** The vessel is the main subject of a typical Crew Management Contract and represents a core cost centre on the basis of which the income and expenses are recorded in almost all ship management organizations. Consequently, the budgeting and other accounting processes are primarily prepared and followed based on a single vessel's name.
- **Name of the Seafarer (OFFSIGNER / ONSIGNER):** This is the cost unit of the seafarer's rank. In the Marlow organization, all crewing expenses are allocated to the single seafarer and this policy, as earlier explained, has been one peculiar characteristic of the new CRM system.
- **The Business Activity (Business Activity):** This is a cost centre that defines the activity involved in the business transaction. In the operational activities of the crewing sections, this may be either Crew Management or Training, whereas other activities (e.g., Administration, New-building, and Supervision) are used in other sections involved in Technical Management. The business activity dimension defines the cost centre, to which certain expenses are charged and reported for management purposes.

- **Main Type of Expenses (Air Travel Paid By / LT Paid By / Salary Paid By):** Air Travel (flight cost), Land Travel, and Salaries are the main variable expenses connected to crew changes. Here, the operational group specifies which party is to be charged with the crew-change related expenses based on the crew change conditions, such as regular crew change due to expiring contract, dismissal of crew or additional crew for specific tasks. A pick list of available options is shown in Figure 16 below. For charges to third parties or for any special arrangements, additional remarks are entered in the respective field (Remarks) in order to clearly specify the reason.
- **Training Area (Training Area):** This field defines the area of training for seafarers under a Marlow training program. Valid values are Deck Cadet (DCAD), Engine Cadet (ECAD), Electrician Cadet (ELCD), Cook Trainee (CKTR), Junior Officer (JR OFC), or Training Other (TRN Other).
- **Training Provider (TRN Provider):** The value in this field specifies the school or institute that provides training to the specific embarking or disembarking seafarer. The main reason for these last two fields is to keep track of the seafarers and trainees under training and to follow up their career development. At the same time, such cost centres help to correctly allocate expenses to the respective training cost centre.

While completing the fields of the FIS, the Crew Superintendent has only minimum manual work to do because the majority of data is automatically processed through an interface with other database applications, such as the CRM Contracts, Vessels/Seafarers Personal Details, and Training Programs. For example, if the seafarer is registered in a training program, the name of the specific training program and the area of his training are automatically transferred to the respective fields. This business rule is possible through an interface between FIS and the training software module. Similarly, other data, such as the name of the seafarer and the business activity, are also available to the screen through other interface logics.

Figure 16: Financial Info Screen (FIS)

The screenshot displays the Financial Info Screen (FIS) with the following details:

**Details** | On-signer N/C | Flight Details | Financial Info. | Candidates Proposed

**OFFSIGNER:**

Business Activity:   
 Air Travel Paid By:  No. of Flights:   
 LT Paid By:  Remarks:   
 Salary Paid By:  Remarks:   
 Training Area:  TRN Provider:

**ONSIGNER:** VERBYTSKYI VALERIY **RANK:** WIPR

Business Activity: CREW MANAGEMENT  
 Air Travel Paid By: MRL-OWNER No. of Flights: 1  
 LT Paid By: MRL-OWNER Remarks: ADDITIONAL ONBOARD FOR TWO MTHS  
 Salary Paid By: MRL-OWNER Remarks:   
 Training Area: ECAD TRN Provider: TRN-ODESSA

**Onsigner land travel paid by**

Paid by	code
MRL 50%-OWNS 50%	14
MRL NORMAL	8
MRL-CREW A/C	9
MRL-OWNER	12
MRL-P&I REPATRIATION	45
MRL-P&I SUBSTITUTE	11
MRL-SHIP VISIT- NORMAL	20
MRL-SHIP VISIT-OWNS'S A/C	21
MSD ACCOUNT	4
SPECIAL AGREEMENT	1

Find %

Find OK Cancel

Ok

(Source: Marlow Data Base, June 2010)

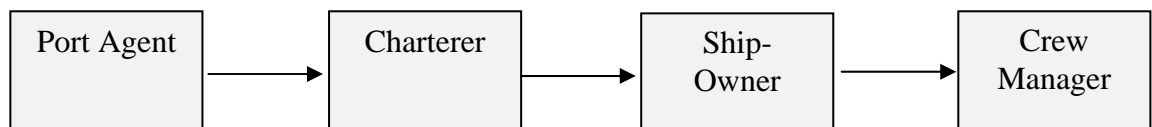
During a normal crew change, which is considered part of the contracted service offered by the Crew Manager to the Ship-owner, there is almost no manual work to be done by the Crew Superintendent on the FIS. He basically has to do some view-checks and activate his approval to the default information generated by the system according to pre-defined business rules. Special remarks are manually posted to the “Remarks” field only when excessive expenses are to be expected due to delays or unexpected changes to the vessel’s schedule during a crew change. Under these circumstances, lengthy hotel accommodation stays and other unforeseen travel expenses may be necessary for seafarers awaiting a delayed ship.

In fact, the Crew Superintendent has to manually amend the default entries in the fields only when an extraordinary business case exists. An “**extraordinary**” case is usually an outcome of a new request for service that is agreed via phone or email communication between the crew superintendent and the ship-owner (client). For example, a ship-owner may request from a Crew Superintendent the employment of an additional deck officer to

cover the operational needs of a particular vessel. In such a case, as per common clause of the CRM contract undersigned by Marlow and its Clients, a ship-owner is liable for all pre-joining expenses, which include all costs related to the initial embarkation of the seafarer onboard the specific vessel. What makes things complicated here is that expenses should initially be paid by the Crew Manager, who thereafter assembles the respective source documents and submits them to the ship-owner for refund. These kind of refundable expenses affect a significant percentage of the total seafarers' movements and, as a result, their accurate and timely identification and processing is unavoidably important. The positive contribution and advantages of the new system will be explained in section 6.2.

It is rather common in a shipping business environment that invoices and other documents arrive in ship management companies' offices only several months after the crew change or other services have been carried out. The agents normally issue a consolidated invoice, which includes all information relevant to the crew change and which is further accompanied by documented proof for each item of expense. This document is known as a **Disbursement Account (DA)**. In cases where no routinized and familiar relationship exists between the Crew Manager and the Port Agent, the latter submits the DA, including crewing and other vessel's port expenses to the charterer of the vessel, who will then, in turn, submit them to the ship-owner. Consequently, the ship-owner will review the DA and isolate crewing expenses that are to be finally charged to the crew manager (see Figure 17).

**Figure 17: Disbursement Account Flow Diagram**



The extensive time-lag, together with the various intermediary stations involved until the document finally arrives at the crew manager's office, often results in the paper being in poor condition. In these cases, the administrators responsible for checking, verifying, and recognizing refundable cost data face real difficulties completing this task. In fact, without any specialized IT instrument to convene the verification of the various DA

items, such a task will always lack accuracy and to some further extent diminish quality as well. It is for this purpose that FIS has been established to provide a tool which facilitates a convenient cross-checking of invoice data against comparative “order” data that are initially generated by crew superintendents.

Of course, **data** of any kind is in itself useless, unless it can be interpreted and processed to determine its true meaning. Then, it becomes useful and may then be called **information**. According to Russell Ackoff, a systems theorist and professor information is data that has been processed to provides answers to “who,” “what,” “where,” and “when” questions. It is highly important for cost control purposes, that among others, the initial data items stored into the system (computer’s language) by crew superintendents provide clear answers (information) to the following two questions:

- **Who** is the party liable to pay the expense?
- **Why** is the party liable to pay the expense?

Generally, the FIS is designed to provide all information that the accountant needs in order to check and verify cost and also decide if this is to be paid by the crew manager or a third party (ship-owner or crew). In order to secure the avoidance of deficiencies, a business rule has been established that makes it mandatory for a crew superintendent to complete the screen fields prior to proceeding to the finalization of other computerized tasks. During the development of the screen, an extensive testing took place, which has made its functions user friendly, requiring less than a minute per seafarer’s processing time for crew superintendents.

### **6.1.2 The Pivot Data Providers**

The seafarers manning agent, the port agent of the vessel, and the training centres are the three main suppliers who are acting as the “Pivot Data Providers” to the new CRM system (see figure 15 – p. 96). These are the parties who initially receive the “order” information from crew superintendents and from there, once they perform the relevant services, and prepare and send the respective invoices to the crew manager for settlement.

**External Suppliers**, who have no strong relationship with the crew manager, simply send invoices in a hardcopy format. Upon arrival at Marlow premises, their documents are delivered directly to the Accounts Payable Section. An accountant checks and posts invoices to the customized journal entry screen, named the Accounts Payable (AP) Module, with no need to transfer them to any other section. As a result, the flow of papers within sections is significantly reduced and an efficient and systematic processing is accomplished.

**Associated Suppliers** send invoices in electronic format, which is suitable for interface into the customized journal entry module. These suppliers are mainly Port Agents and Manning Agents, who are either contracted by Marlow or are Marlow subsidiaries and have access to the main crewing database of the organization. Their invoices normally include a huge volume of transactions and are issued and sent on a regular basis. For example, a Manning Agent in the Philippines may produce an invoice for recruitment expenses (seafarers' travelling, visa, licenses and documents, etc.) that includes more than a thousand transaction lines, reflecting the large number of Philippine seafarers employed, on a monthly basis. Once received, the invoice is automatically processed to the AP Module and its basic data, such as the names of the vessels/seafarers and respective dates and cost amounts, are automatically transferred to the customized journal entry fields. What basically remains for the accountant is to complete a view-check for the appropriate in-house account coding of transactions, to monitor the identification of refundable expenses, and finally to transfer invoices to the ledger. The time spent in the new interface processing of excel formatted invoices, in comparison with previous manual processing, is found to be dramatically decreased. Other important quality oriented advantages are also achieved, which are to be explained in section 6.2.

Finally, the **In-house Sections** of Crew Accounts and Insurance are also acting as Pivot Data Providers. Based on seafarers' employment planning prepared by Crew Superintendents, the two sections prepare and process seafarers' wages and insurance accounts to the AP Module. Similarly to other suppliers' accounts payable transactions, the relevant source documents are checked, approved, and finally posted by the accountants to the ledger through an electronic interface. The integration of AP Module with the other main crewing software applications provides the basis for an efficient and

accurate processing of these “sensitive” areas of crewing cost, the wages, and insurance of crew.

### **6.1.3 Data Processor- Customized Journal Entry Screen (AP Modules)**

As illustrated in the CRM data flow chart, through a customized journal entry screen, an accountant has direct access to all operational information necessary for the processing of all incoming invoices. This section analyses the development and functionalities of this module and illustrates its main advantages and characteristics.

For approximately a three-month period of time, a number of accountants (control group) participated in the test process, which aimed at reporting all possible information which is considered vital during the checking and processing of crewing Accounts Payable (AP) transactions. Several types of purchasing source documents, such as disbursements, invoices, crew wages, and insurance accounts, were processed by this group of accountants in a test database environment. Consequently, all information which was found to be necessary during the processing of the documents was identified and categorized in computerized and non-computerized forms:

- ❖ Non-computerized information solely derives from Crew Superintendents, who are basically the Initial Data Providers. For this purpose, the process of FIS has been established, which, as previously explained, aims at generating and maintaining this information in a computerized form. Moreover, the initial coding on the basis of a single seafarer became a mandatory operational task for Crew Operation groups.
- ❖ Existing computerized information mainly concerns the vessel and employment of seafarers and derives from the following crewing software modules:
  - Crew Change History (C/C Hist.)
  - Crew Change Planning (C/C Plan.)
  - Crew List
  - Cash to Master (CTM)



- Crew Management Contract (Line up)
- Medical Report (Med. Rep.)

Once all information useful for the accountant had been established in a computerized form, a technical analysis follows in order to set up the requirements for the development of a customized “Journal Entry” Module. The in-house IT developers, together with the assistance and participation of other staff members, worked for a couple of months in order to finally develop a program called AP Module (see Figure 18), which became the “**Data Processor**” in the data flow chain of the new CRM system.

Figure 18: A Customized CRM Journal Screen (AP Module)

Click buttons (direct access to empirical operational data)

FIS

Automatic identification of refundable expenses

The new module provided the following three innovative functionalities:

- ❖ Convenient retrieval of empirical seafarers' and vessels' data/information (FIS, medical, wages, crew list etc.) through direct links, which may be activated by simple button clicks that are available on the screen (e.g., access to FIS through the name of seafarer).
- ❖ Analysis and recording of cost business transactions on the basis of the following dimensions:
  - Vessel's Name
  - Seafarer's Name
  - Seafarer's Nationality
  - Port of embarkation/disembarkation
- ❖ Automatic identification and processing of refundable expenses (Paid By column) through business rules established to provide direct links with the CRM contract and other in-house software.

The AP Module was initially implemented in a test database environment in order to be used and evaluated by the “control group” of accountants for a period of one month. At the same time, a “control group” of crew superintendents was formed in order to review the processing of documents and identify possible errors or deficiencies. The aim was to ensure that correctness of the processed accounting data was accomplished by the accountants without the involvement of crew superintendents (change of process). The effectiveness of the new process had to be checked and evaluated primarily by crew superintendents (the ‘order’ generators). Moreover, the performance of accountants’ working groups was evaluated in terms of the time needed to check, verify correctness and record the bookkeeping transactions of an invoice.

This exercise continued for another month with the participation of additional groups from other sections. The fact that many people were involved in the development as well as in the new module implementation process improved their motivation and minimized their resistance to change. It should be noted that computer mediated communications,

such as internet and video conferences, were used in order to involve Marlow Germany's and Marlow Netherlands' employees in the project.

IT developers collected the comments and suggestions made by all working groups and consequently worked to provide all relevant enhancements and corrections. The module was completed and implemented into a live environment in January 2005. Contrary to the traditional journal entry modules, Marlow AP Module is an IT instrument that enables the complete processing of all purchasing source documents to be made in the accounts section with no need to transfer the documents to any other in-house section. During the journal entry process, empirical data related to the movement of seafarers are conveniently available on the screen for the accountant; thus, the efficiency of cost checking, verification and posting process has significantly improved since the introduction of this highly specialized tool.

Currently, all types of accounts payable source documents, including expenses such as manning fees, crew wages, and land and air travel expenses are either directly entered or imported from other IT sources in the AP Module. Consequently, all accounting data are transferred through an interface to the financial ledger. At the same time, refundable expenses are automatically transferred to the Sales Software Module ready to be selected as sales order items and invoiced to the clients. The advantages of this integrated process, which are explained in the next section, have been recognized by the company's accountants and ship operators (critical communities) at an early stage, which led to the complete replacement of the traditional double entry accounting screen. The new CRM system has been developed to accommodate the needs of all companies of Marlow organization in Cyprus and abroad. It is currently being used by Marlow Cyprus, Marlow Germany, and Marlow Netherlands. In the near future, it is expected that the project team will schedule its implementation to other affiliated companies of the organization in East Europe and Asia.

## 6.2 Measurable Benefits

### 6.2.1 Increased Productivity

Economic activity can be identified with production and consumption. Production is a process of combining various immaterial and material inputs of production, such as IT mechanisms and employees, so as to produce services or goods for consumption. This way of combining the inputs of production in the process of making output is called technology. Two components can be distinguishable in output increase: the growth caused by an increase in production input and the growth caused by an increase in productivity (Saari, 2006). Companies can increase productivity in a variety of ways. The most obvious methods involve automation and computerization, which minimize the number and complexity of tasks that must be performed by employees.

Characteristic of the growth effected by an input increase is that the relation between output and input remains unchanged. The output growth corresponding to a shift of the production function is generated by the increase in productivity. Accordingly, an increase in productivity is characterized by a shift of the production function and a consequent change to the output/input relation. The formula of the total productivity is normally written as follows:

**Total Productivity = Output / Input quantity**

In order to evaluate the performance of the new integrated CRM system, a productivity indicator is established based on the above formula. Specifically, the seafarers employed, who are considered the core element of the typical CRM service offered to ship-owners, constitute the output produced by a Crew Management company. The office personnel and the use of available resources and technology are the two main components of an input quantity. In simple words, the growth of seafarers' number will normally be reflected either in:

- a growth in productivity as a result of a more rational use of personnel and available resources and technology, *or*

- a decrease in productivity as a result of an inefficient use of personnel and available technology, *or*
- unchanged productivity as a result of no change to the degree of efficiency and effectiveness by which personnel and available resources are used.

In order to arrive at a feasible productivity indicator, the input quantity is restricted to the number of office personnel. This way, any increase or decrease in productivity should normally indicate a change in their use and/or their knowledge and capabilities, as well as in the combined use of available technology and resources. A Key Indicator of a sections' operational productivity is therefore held to be the ratio between the number of the office personnel (input/cost) and the number of seafarers onboard vessels (output).

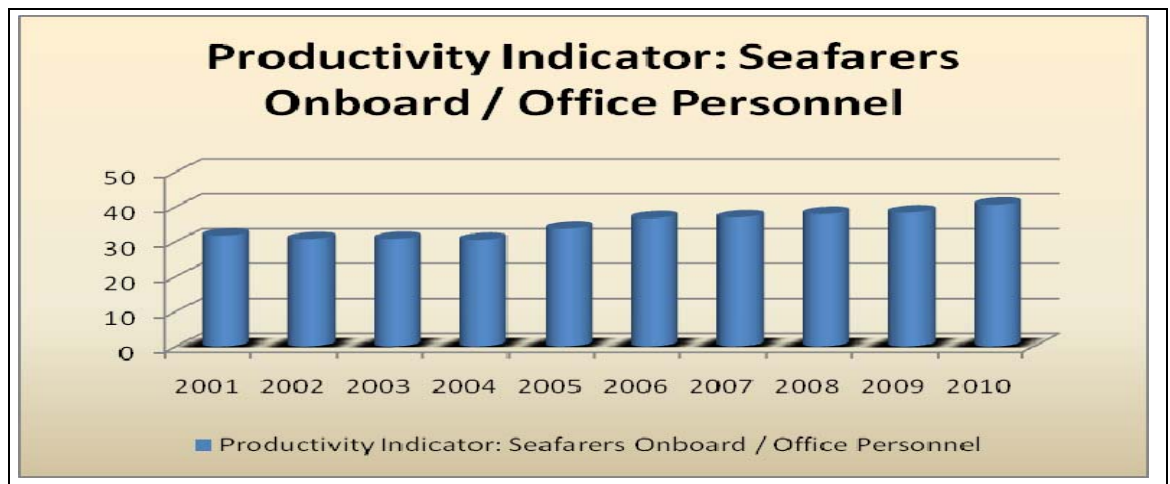
**Total Productivity = Number of Seafarers Onboard / Number of Office Personnel**

A statistical analysis of the results over the past ten years based on the above formula can quantify the impact of the new CRM on administrative productivity. In Table 6.1, the 3.34% decrease in the productivity indicator, which took place in 2002 (column D), reflects the proportionally increased rate of additional office personnel (column B) in comparison to the rate of additional seafarers employed (column A). In 2003 and 2004, the employment growth rate of office personnel and seafarers appears almost identical; consequently, no significant change occurred in the productivity indicator during this period of time. In real numbers, one employee in office administration corresponded to 30.75 seafarers employed in 2002, whereas, one employee in office administration corresponded to 30.83 and 30.55 seafarers employed in 2003 and 2004, respectively (column C). It should be noted that this close relationship between the two variables was only to be expected, since seafarers generate most of the business transactions, which, in turn, provide the main source of office administrative workload, mainly through the derived operating expenses. One can assume that the relationship is further empowered due to the lack of software and other IT mechanisms to minimize extensive manual intervention in controlling and processing of business transactions.

**Table 2: Productivity Indicator: Seafarers On Board & Office Personnel**

Year	No. of Seafarers Onboard A	No. of Office Personnel B	Productivity Indicator: Seafarers Onboard / Office Personnel C	Percentage of Change D
2001	4994	157	31.81	0.00%
2002	5442	177	30.75	-3.34%
2003	5581	181	30.83	0.29%
2004	6049	198	30.55	-0.92%
2005	6996	207	33.80	10.63%
2006	8163	222	36.77	8.80%
2007	9734	263	37.01	0.66%
2008	10486	276	37.99	2.65%
2009	10605	276	38.42	1.13%
2010	11265	277	40.67	5.84%

**Figure 19: Productivity Indicator**



(Source: Marlow Data Base June 2010)

The year 2005 appears as the starting point for a trend of substantial positive change in productivity. Specifically, in comparison to 2004, the productivity indicator in 2005 shows a remarkable increase of 10.63 percent. This positive change progressively continues in 2006, where an increase of 8.80 percent is accomplished. From thereon, the productivity performance is maintained at this good level with further small

improvements of 1.86 and 1.38 percent in 2008 and 2009, respectively. The customized AP Module established in the beginning of 2005 has been subsequently enhanced with post implementation functionality improvements through the continuing process of the action research cycle (2nd and 3rd-final cycle took place). The final cycle in 2009 ensured the stabilization of the new crew management system and its general acceptance by the users. As of 2010, the new integrated CRM System is fully functional, offering increased productivity and other correlated operational synergies to all sections involved in administrative crewing activities. In real numbers, in 2004 one employee in office administration corresponded to 30.55 seafarers, whereas in May 2010, one employee in office administration corresponds to 40.67 seafarers. This result constitutes a quantitative indicator that records a significant overall increase in productivity level of approximately 33.00 percent. The AP Module has been the core module and one of the most vital components of the new system. As a “data processor,” provided the basis for the convenient processing of business transactions and the effective link (integration) between operational applications and the accounting software.

### 6.2.2 Improved Reporting

With the establishment of the customized journal entry module (the AP Module) the analysis and coding of expenses is executed on the basis of a single seafarer with no additional manual effort by the accountants. The name of the seafarer together with the other related dimensions, such as his nationality and the port of his embarkation or disembarkation, automatically appear on the screen with a simple activation of a business validation. The validation is triggered by the processing of the vessel’s name and transaction’s occurrence date into the journal entry screen. It should be noted that these two core information are always included in an invoice issued by any vessel’s agent or other supplier. **The vessel’s name** is the main subject of the invoice and **the transaction’s occurrence date** refers to the specific date that the service or goods have been delivered to the vessel. Consequently, these two variables, accompanied with all associated dimensions/cost centres, are stored into the database bookkeeping programs by the accountant. As a result, this enriched recording of data provides the capability for improved and innovative managerial reporting. It is not an exaggeration to assert that some of the extracted data have not yet been given by any other source of the maritime

industry. This statement is supported by the fact that no other ship management company in the maritime center of Cyprus has yet implemented such dynamic and specialized transactions processing IT tools.

The reporting capabilities of the AP module offer unique information, which can be very valuable to ship-owners, ship managers and other industry stakeholders. For example, the average seafarer's traveling costs at each specific port of the world is available at a glance. Such reports provide critical information to crew superintendents when they try to select, among several ports, the most convenient and economical one for a crew change to take place. They can review the empirical data extracted and convenient tailor-made reports in order to compare the cost of various ports and decide accordingly on an optimal option.

Figure 20 indicates to a crew superintendent that, for a vessel scheduled to call at the ports of Barcelona, Genoa, and Rotterdam, the most economical place for Ukrainian seafarers to embark or disembark would be Rotterdam. The report shows, in particular, that the company paid during the period from March 2009 until March 2010 for crew changes in Rotterdam flight expenses for 621 embarking (**E**) and 669 disembarking (**D**) Ukrainian seafarers, whereas, for the same period the company paid land travel expenses (land transport, hotel accommodation, agency fee, etc.) for 729 embarking and 692 disembarking Ukrainian seafarers. The average flight cost per seafarer for embarking a vessel (**AVG E**) was 361.74 USD, for disembarking a vessel (**AVG D**) it was 407.36 USD, and the amount for both (**AVG E+D**) was 385.40 USD. As far as the average land travel cost in Rotterdam is concerned, for the embarking seafarers it was 380.00 USD, for the disembarking 258.70 USD, and for both 320.93 USD. The total average cost for flight and land travel per seafarer reaches the amount of 706.33 USD. Similar comparative data for the other two ports, which the vessel calls, are also available in the report; thus, the crew superintendent can conveniently compare the cost and evaluate his options, always in parallel with other operational vessel's needs. In Barcelona, as well as in Genoa, the comparative costs appear to be considerably higher than in Rotterdam; thus, the latter port is obviously economically the most suitable option for a crew superintendent.



**Figure 20: Average Travelling Cost (by Nationality) – Port: Singapore**  
**Period: 01.2009 – 12.2009, Currency: USD**

<b>NATIONALITY: UKR (UKRAINE)</b>					
<b>Port: Barcelona</b>					
<b>Expense Type</b>	<b>E</b>	<b>D</b>	<b>AVG(E)</b>	<b>AVG(D)</b>	<b>AVG(E+D)</b>
AIR TRAVEL	49	67	420.14	438.51	430.75
LAND TRAVEL	56	54	694.28	608.14	651.99
<b>Total Average Cost</b>			<b>1,114.42</b>	<b>1,046.65</b>	<b>1,082.74</b>
<b>Port: Genoa</b>					
<b>Expense Type</b>	<b>E</b>	<b>D</b>	<b>AVG(E)</b>	<b>AVG(D)</b>	<b>AVG(E+D)</b>
AIR TRAVEL	16	22	450.58	471.58	462.74
LAND TRAVEL	18	18	666.23	378.00	522.12
<b>Total Average Cost</b>			<b>1,116.81</b>	<b>849.58</b>	<b>984.86</b>
<b>Port: Rotterdam</b>					
<b>Expense Type</b>	<b>E</b>	<b>D</b>	<b>AVG(E)</b>	<b>AVG(D)</b>	<b>AVG(E+D)</b>
AIR TRAVEL	621	669	361.74	407.36	385.40
LAND TRAVEL	729	692	380.00	258.70	320.93
<b>Total Average Cost</b>			<b>741.74</b>	<b>666.06</b>	<b>706.33</b>
E: (Embarking Seaman)					
D: (Disembarking Seaman)					

(Source: Marlow Data Base, June 2010)

Besides cost by port, the report can also be produced in terms of seafarer's nationality, rank, vessel type, ship-owner, and other related dimensions. According to the vessel's trading area, the ship-operator may utilize information from such reports prior to selecting the nationality of crew to be employed on his vessel(s). In the particular case of the port of Singapore, which is illustrated in Figure 21, the traveling related cost for Philippine (PHL) seafarers is significantly lower in comparison with the respective cost for seafarers coming from Eastern European countries. In particular, for the period of January 2009 to December 2009, in the port of Singapore, the company organized the movement of 473 embarking (Number E) and 482 disembarking (Number D) Philippine seafarers. The average cost for embarking seafarers (Avg Cost E) paid by the company was 851.85 USD, for disembarking seafarers (Avg Cost D) it amounted to 425.64, and for both (Avg Cost E+D) it was 636.74 USD. The comparative costs of Ukrainian (UKR) as well as of the Russian (RUS) and Polish (POL) seafarers prove to be significantly higher. Consequently, the report suggests that a vessel with regular trade in Singapore, if manned with a Philippine crew, will produce significant travel cost efficiencies.

**Figure 21: Average Travelling Cost (by Nationality) – Port: Singapore**  
**Period: 01.2009 – 12.2009 (Currency: USD)**

Nation	Avg Cost (E)	Avg Cost (D)	Avg Cost (E+D)	Number (E)	Number (D)
BGR	1,828.18	1,497.33	1,672.49	18	16
CHN	0.00	536.32	536.32	0	1
DEU	919.38	753.35	803.16	6	14
DNK	857.52	0.00	857.52	1	0
EST	965.29	1,660.54	1,243.39	6	4
HRV	186.52	4,703.21	2,444.86	2	2
LKA	0.00	1,083.65	1,083.65	0	1
LTU	1,873.04	1,105.42	1,443.17	11	14
LVA	0.00	1,468.89	1,468.89	0	1
MDA	0.00	1,151.94	1,151.94	0	1
MMR	1,274.83	455.12	856.25	23	24
MNE	0.00	1,064.51	1,064.51	0	1
NLD	0.00	4,976.34	4,976.34	0	1
PER	134.11	0.00	134.11	1	0
PHL	851.85	425.64	636.74	473	482
POL	1,423.93	1,063.52	1,233.13	64	72
ROU	1,595.23	1,143.72	1,369.47	15	15
RUS	1,607.08	1,101.15	1,375.92	63	53
SVK	0.00	256.03	256.03	0	1
UKR	1,498.53	1,138.73	1,319.16	338	336
<b>ALL</b>	<b>1,228.61</b>	<b>806.39</b>	<b>994.46</b>	<b>1021</b>	<b>1039</b>

(Source: Marlow Data Base, June 2010)

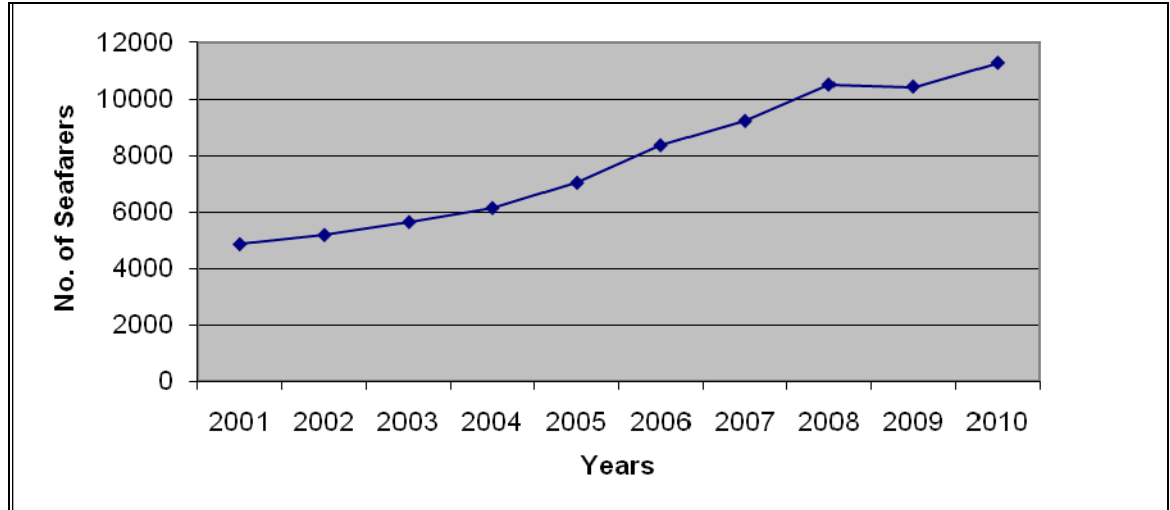
Additionally, empirical data that can be extracted from AP Module provide the Management with the capability to improve budget cost estimations and to present to ship-owners alternative manning options based on the vessel's trading area and crew nationality.

### 6.2.3 Improved Cost Control

The customized AP module provides access to all historical crew data and enables the efficient verification of cost as well as the automatic identification of refundable expenses based on the relevant business rules created for that purpose. It is obvious from the productivity analysis and evaluation previously presented that, considering Marlow's present volume of workload, the result achieved would have proved to be an insurmountable task, at least with the existing office staffing levels. In 2010, the number

of seafarers employed by Marlow exceeds 11,500, almost doubling the respective number employed back in 2004 when the AP project had only started (see Figure 22).

**Figure 22: Seafarers' Employment Growth Rate**



(Source: Marlow Data Base, June 2010)

The cost accounting control process in its previous status required the review and final manual approval of the crew superintendent for the verification and coding of any crew operational expense. This procedure has changed with the advent of the new CRM system, which is characterized by its advanced integrated and computerized accounting functionalities. It improved the ability of crew superintendents to accurately produce order information, which in turn increased the efficiency by which the cost control is being handled throughout all departments. The results of a **KPI (key performance indicator)**, which was established in 2009 to evaluate the degree of effectiveness by which the Crew Superintendents generate and maintain the cost data related to the employment of seafarers, provides a clear proof of this positive change. The particular KPI is an outcome of the following formula:

$$\text{Operational Group KPI} = \text{Coding Errors} / \text{Workload (crew movements)}$$

Based on the above KPI formula, one report was developed to show an overview of the performance for the whole crew operations section (Figure 23) and a second to provide a detailed analysis for each operational group (Figure 24).

The **workload** of each operational group (OPR CODE) is represented by the total number of embarkations (EMBARKING) and disembarkations (DISEMBARK) and appears in the report's column with the heading (EMB.+DIS.) of Figure 23.

In the same report, the number of **coding errors** registered by Crew Superintendents is illustrated in the column with the heading (ERRORS) and represents the cases for which crew superintendents have entered wrong order data into FIS. The errors are identified by a group of accountants who have the expertise to carry out this kind of control during the processing of invoices and disbursements into the AP module.

The report also shows the total number of all changes made to the initial data recorded in FIS by crew superintendents (CHANGES) followed by the split up of these changes into normal changes (NORMAL), that is, changes related to normal business cases resulting from an amendment to an existing agreement with ship-owners, and those of purely erroneous entries (ERRORS).

Based on the formula explained, the last column of the report indicates the KPI of the group, which is the ratio of the total number of coding errors to the total number of crew movements executed (workload) during a selected period. This KPI, apart from recording the ratio of errors appearing in the FIS, aimed also at identifying training requirements for Crew Superintendents.

It is obvious from the overview results for September 2009 (Figure 23) that a number of Crew Superintendents were in need of additional training to improve their understanding and awareness of financial impacts directly related to their work. Specifically, groups A1, A7, B3, and M2 presented a high rate of errors in comparison with other operational groups.

**Figure 23: Modify Financial Info - Group Analysis (01.09.2009-30.09.2009)**

OPR CODE	EMBARKING	DISEMBARK	EMB.+DIS.	CHANGES	NORMAL	ERRORS	K.P.I.%
A1	69	73	142	36	12	24	16.99
A2	97	99	196	9	3	6	3.06
A3	60	67	127	9	1	8	6.30
A4	68	71	139	6	0	6	4.32
A5	66	67	133	18	7	11	8.27
A6	74	83	157	19	7	12	7.64
A7	61	76	137	86	34	52	37.96
A8	62	67	129	3	1	2	1.55
A9	74	107	181	18	6	12	6.63
B1	80	81	161	17	5	12	7.45
B2	111	120	231	11	5	6	2.60
B3	116	120	236	71	38	33	13.98
B4	74	67	141	0	0	0	0.00
B5	134	128	262	20	6	14	5.34
B6	54	47	101	4	1	3	2.97
B7	112	117	229	22	12	10	4.37
B8	82	93	175	23	6	17	9.71
B9	46	57	103	1	1	0	0.00
D1	83	99	182	15	3	12	6.59
D2	68	70	138	21	9	12	8.70
D3	75	81	156	22	7	15	9.62
D5	0	0	0	0	0	0	0.00
M2	41	41	82	40	28	12	14.63
M3	27	25	52	1	1	0	0.00
<b>TOTAL</b>	<b>1734</b>	<b>1856</b>	<b>3590</b>	<b>472</b>	<b>193</b>	<b>279</b>	

(Source: Marlow Data Base, June 2010)

The detailed analysis for each single group specifies the vessel code (CODE) and name (VSL NAME), the name of the crew member concerned (SEAMAN NAME), the port and date of the respective crew change (PORT / DATE), the field that was changed in the FIS (FIELD), the old and the new value of this field (OLD and NEW), the type of change (N for normal business related changes or E for erroneous entries) and the employee who effected the change in the FIS (PIC), in an abbreviated form. Additionally, the analysis per group shows the cost impact of specific errors as an indication of the possible loss the company may have encountered if the error had not been detected. The amounts of the possible cost impact indicate the average cost at the respective port, which is calculated from recorded empirical bookkeeping data. This feature proved very helpful in further raising the cost awareness of crew superintendents.

Based on the results of these reports, monthly training sessions were conducted for superintendents and their assistants with poor KPI. Eventually, their performance improved and, thus, accurate and reliable data provided via the FIS were finally accomplished. Consequently, this has resulted in a higher productivity in the work of accountants who rely on FIS in order to verify cost and complete processing of invoices.

**Figure 24: Modify Financial Info Statistics - Group Detailed Analysis (01.09.2009-30.09.2009)**

OPERATOR CODE		AI								
CODE	VSL NAME	SEAMAN NAME	PORT / DATE	FIELD	OLD	NEW	TYPE	PIC	COST	IMPACT
745	KLAUS J	TAPEC N.	SINGAPORE - 06/09	BUSINESS ACTIVITY	TRN-PHILIPPINES	CREW MANAGEMENT	E	K.S		
750	CMA CGM MONTENEGRO	GABATAN C.	JEBEL ALI - 07/09	LT PAID BY	MRL NORMAL	MRL-OWNER	E	Y.P	1,008.39	
877	HEINRICH J	SAMSON E.	MIAMI - 11/08	LT PAID BY		MCR-NORMAL	E	Y.P		
877	HEINRICH J	NEVES DUARTE	NEW ORLEA - 05/09	LT REMARK		AS PER CE PORTUGUESE	N	Y.P		
877	HEINRICH J	SAMSON E.	NEW ORLEA - 08/09	LT REMARK	DIRECT TSF	DIRECT TSF, AS PER C	E	Y.P		
877	HEINRICH J	NEVES DUARTE	NEW ORLEA - 08/09	LT REMARK		AS PER CE PORTUGUESE	N	Y.P		
877	HEINRICH J	NEVES DUARTE	MIAMI - 11/08	LT REMARK		AS PER CE 21/9/09 PO	N	Y.P		
877	HEINRICH J	SAMSON E.	MIAMI - 11/08	LT REMARK		AS PER CE 21/9/09, P	N	Y.P		
877	HEINRICH J	SAMSON E.	NEW ORLEA - 05/09	LT REMARK		AS PER CE PHL CREW O	E	Y.P		
877	HEINRICH J	NEVES DUARTE	NEW ORLEA - 05/09	LT PAID BY	MCR-NORMAL	MCR-OWNER	E	Y.P	1,430.45	
877	HEINRICH J	NEVES DUARTE	NEW ORLEA - 08/09	LT PAID BY	MCR-NORMAL	MCR-OWNER	E	Y.P	1,362.33	
877	HEINRICH J	NEVES DUARTE	MIAMI - 11/08	LT PAID BY		MCR-OWNER	E	Y.P		
2950	MAERSK RAVENNA	CENTINALES J.	LA GUAIRA - 12/08	BUSINESS ACTIVITY	TRN-PHILIPPINES	CREW MANAGEMENT	N	K.S		
2950	MAERSK RAVENNA	NAVALTA D.	SANTOS - 08/08	BUSINESS ACTIVITY	CREW MANAGEMENT	TRN-EMSSSTROM	N	K.S		
3480	DANA HOLLANDIA	TOKARCZYK M.	ROTTERDAM - 07/09	LT REMARK		DMB, CHANGE OF LINE	N	Y.P		
3480	DANA HOLLANDIA	TOKARCZYK M.	ROTTERDAM - 07/09	LT PAID BY	MCR-NORMAL	MCR-OWNER	E	Y.P	982.87	
3498	DANA GOTHIA	SAVKIN R.	ROTTERDAM - 07/09	LT REMARK	ARRANGE DEU DOCUMENT		N	Y.P		
3498	DANA GOTHIA	SAVKIN R.	ROTTERDAM - 07/09	LT PAID BY	MCR-OWNER	MCR-NORMAL	E	Y.P	982.87	
3673	CANOPUS J	ESPAYOS R.	ROTTERDAM - 09/09	LT REMARK		2 FOR 1 ON OWNERS' A	N	K.S		
3673	CANOPUS J	ESPAYOS R.	ROTTERDAM - 09/09	LT PAID BY	MRL NORMAL	MRL-OWNER	E	K.S	954.43	
3859	INDUSTRIAL DREAM	PACLIBAR R.	SINGAPORE - 02/09	BUSINESS ACTIVITY	TRN-PHILIPPINES	CREW MANAGEMENT	E	K.S		
3859	INDUSTRIAL DREAM	SILVA H.	SINGAPORE - 02/09	BUSINESS ACTIVITY	TRN-PHILIPPINES	CREW MANAGEMENT	E	K.S		
3859	INDUSTRIAL DREAM	SILVA H.	SINGAPORE - 02/09	SAL PAID BY	SPECIAL AGREEMENT	SALARY DIFFER. TRAIN	E	K.S		
3904	ANDROMEDA J	SAAT K.	ROTTERDAM - 07/09	LT PAID BY	MCR-OWNER	MCR-NORMAL	E	Y.P	982.87	
3904	ANDROMEDA J	SAAT K.	ROTTERDAM - 07/09	LT REMARK		THE FLIGHT IS FOR GE	N	Y.P		
3976	PAVO J	SORSO J.	LEMASSOL - 04/09	TRAINING AREA		CKTR	N	K.S		

(Source: Marlow Data Base, June 2010)

At the same time, a reduction in human errors connected to properly charging refundable cost to the correct party (ship-owners or crew) was noted. The limited errors were examined and found to be caused by lack of attention rather than lack of knowledge. Figure 25 shows the improved KPI after only 8 months of regular training.

Based on the average cost of a crew change and the respective number of errors that appeared during the first months after the introduction of the FIS, the financial impact of errors is estimated (based on KPI analytical report) at approximately 70,000 USD each month. This estimate leads to the logical assumption that an average amount of around 60-80 thousand USD can be saved every month by merely charging the expenses to the



Figure 25: Modify Financial Info - Group Analysis (01.05.2010-31.05.2010)

OPR CODE	EMBARKING	DISEMBARK	EMB.+DIS.	CHANGES	NORMAL	ERRORS	K.P.I.%
A1	91	95	186	16	14	2	1.08
A2	102	115	217	8	6	2	0.92
A3	70	77	147	6	5	1	0.68
A4	92	98	190	7	7	0	0.00
A5	51	64	115	33	30	3	2.61
A6	92	110	202	25	24	1	0.50
A7	110	101	211	14	13	1	0.47
A8	61	67	128	39	39	0	0.00
A9	94	108	202	15	11	4	1.98
B1	100	104	204	17	14	3	1.47
B2	91	109	200	12	11	1	0.50
B3	153	157	310	20	18	2	0.65
B4	90	80	170	2	2	0	0.00
B5	173	165	338	11	10	1	0.30
B6	38	49	87	17	17	0	0.00
B7	106	122	228	24	17	7	3.07
B8	93	105	198	4	3	1	0.51
B9	68	77	145	3	2	1	0.69
D1	102	111	213	5	4	1	0.47
D2	85	79	164	15	13	2	1.22
D3	73	74	147	13	12	1	0.68
D5	16	17	33	14	14	0	0.00
M2	36	29	65	8	7	1	1.54
M3	25	22	47	2	2	0	0.00
<b>TOTAL</b>	<b>2012</b>	<b>2135</b>	<b>4147</b>	<b>330</b>	<b>295</b>	<b>35</b>	

(Source: Marlow Data Base, June 2010)

correct third party. More specifically, the extracted KPI analytical report showed a total financial impact for all groups of USD 71,557.16 in September 2009 (reflecting to the total 279 errors – see Figure 23 p. 116), whereas with the development and running of in-house training programs, the same report showed a total cost impact of only USD 5,986.75 in May 2010 (reflecting to the total 35 errors – see above Figure 25). Consequently, an improved cost control was accomplished through the accurate tracing and handling of refundable expenses. The remaining small amount of entry errors was considered to be at an acceptable level, as it usually appears in every similar working environment.

Generally, the new CRM system increased the accuracy by which the cost data is entered into the computer. This is mainly accomplished through better use of HR and IT instruments. As a result of the efficient build-up and handling of clients' and suppliers' accounts, cash flow was also simultaneously improved through better cost control and debt collection.

#### 6.2.4 Summary of Main Working Efficiencies and Synergies

The positive development of productivity levels has been accomplished due to the more rational use of personnel and available resources and technology. This has been the outcome of the implementation and running of the new integrated CRM System. Functional processes and data flow improvements, which are by now well established, have produced significant working efficiencies and synergies in the organizational sections; a summary of the most important is listed here-below:

- Crew operation groups are no longer involved in the invoice handling and coding procedure. The new in-house workflow process, as described, abolished the need for crew superintendents to physically receive invoices. Consequently, their man-hours saved are utilized for other activities mainly related to planning and recruitment tasks. Moreover, crew superintendents can now obtain access to meaningful cost information, which enables them to optimize their decision making process on operational matters. In addition to those work related advantages, some indirect, non-measurable benefits were also accomplished. The main aspect here is that crew superintendents are no longer engaged in administrative work and are now free to focus on the operational front line with clients' matters. They can extensively discuss crew planning and crew performance as well as any other subject the ship-owners may deem of interest, thus giving the company's customers a feeling of being highly valued and cherished. It should be noted that crew superintendents are **customer-contact employees**, whose role is particularly important. They are the people whose main duties bring them into regular contact with customers, mainly by telephone or through e-mail. Therefore, the new process provides them with excellent opportunities to tighten the bond between the company and the customer, an advantage that certainly cannot be expressed in clear measurable amounts. However, without any doubt, such close relationships form the base on which a customer-driven company can build, and, more importantly, expand its business operations.



- Apart from freeing the crew operational groups from administrative tasks and paperwork, the new workflow process allows the Administrators in the Crew Disbursements Section to handle almost all incoming invoices and disbursement accounts on their own without the need to transfer them to any other in-house operational section. In other words, it provides them with an **empowerment**, which is the authority to make decisions and to have better control over their work:

*“From employees’ point of view, empowerment increases their creativity and initiative, as well as their commitment to the organization, by allowing them to work with autonomy.” (Jonathan et al, 2004:84)*

During the journal entry process, all vital data related to the vessels and seafarers are conveniently available in the customized journal entry screen of the AP Module, which is the main IT instrument available to administrators (users). Consequently, the efficiency of cost checking, verification, and posting business transactions is significantly improved.

Given the fact that the bookkeeping transactions are interfaced from the AP Module directly to the ledger, the crew disbursement section takes the full responsibility for data correctness, as well as for the required cost control. As documents are no longer moved between various in-house sections, but instead are initially collected and remain until their final processing to the ledger in the same place within the company’s building, tracing of their location has been very much simplified.

- Refundable expenses are automatically identified through various business rules established in the AP Module and subsequently transferred to the **Financial Section** (Sales) to be charged to the various ship-owners. As a result, the time and effort needed for the financial administrators to trace and invoice refundable expenses has almost been optimized. Moreover, the computerized recording of refundable expenses significantly minimizes the risk of them being overlooked. Given the fact that this improvement in the work process leads to major reductions

in defects, it improves the quality of sales and invoicing work. It should be noted that quality excellence derives from well-designed work processes and administrative systems that stress prevention (Evans, 2005). Finally, the availability of data related to the invoice order with all supportive information in a computerized system has substantially minimized the contact time with other sections, resulting in improved productivity and overall quality of work in this section.

- **The Insurance Section** no longer receives cost related source documents including general medical expenses. Since the cost is allocated on the basis of a single seafarer, the AP module produces insurance claim accounts that analytically report medical cost and related details of the case involved. Based on various business validations, the system easily recognizes the limited medical cases for which the claimed amount exceeds the franchise agreed with the Insurers, and thus making it eligible for refund. Consequently, hardcopies of original invoices are only requested for a small number of automatically identified cases, without the need to create any paper flow for the majority of cases, which are not eligible for refund. As a result, inter-section communication and paper flow has been significantly reduced, freeing time to concentrate on the actual case related tasks.
- **The Crew Accounts Section**, which handles seafarers' salary accounts, starts the monthly wages calculation from a screen that shows the seafarers' positions included in the CRM contract for the vessel on one side and on the other side the crew presently on board as well as those who signed off during the past month. Further information is obtained from the FIS, such as the party to be charged for the salary of seafarers who are on board but not included in the CRM contract. The administrator is then able to conveniently trace and control wages cost for the big volume of 'extraordinary' business cases and consequently charge cost to the appropriate party. Through these features, the productivity and quality of the relevant tasks carried out by the section's administrators could be significantly increased by enabling them to efficiently and punctually process the wages of the growing number of Marlow seafarers.

As usually happens with any major change of traditional or routine organizational working practices, next to the significant benefits obtained by the implementation of the new system, there were, of course, still some problems and employee dissatisfaction to be observed. These were systematically recorded and evaluated by the Project Management team. Among others, the evaluation phase of action research aimed at identifying specific problems and at allowing the next research cycle to start. During the first two years, the project team monitored two cycles to run, always via the same route, stations of an action research. The process and data flow system was therefore continuously enhanced with additional improvements, by which the productivity as well as the quality performed in all sections could not only be maintained at high levels but even be further increased. It is expected that all the above-mentioned advantages and positive changes will lead to a remarkable boost in the quality of services rendered, resulting in a high customer satisfaction and consequently a higher intangible value of the company, which clearly constitutes an invaluable competitive benefit.

## Chapter 7: Conclusions and Reflections

### 7.1 Conclusions

The increasing breadth and depth of all variants of regulation since the 1980s – regional, national and international regulations and shipping industry’s own self-regulation – have required improved managerial sophistication among ship managers. In many cases, accordingly, conscientious ship owners with relatively small numbers of ships, and sometimes larger owners with diversified fleets, have found it prudent to sub-contract for a range of operational functions of which crew management is the most frequently out-sourced function.

As we have seen in the Introduction, ship management companies have proliferated since the 1980s and the proportion of the world’s fleet under one or another operational management function has shown steady growth. However, although there has been a growing market for sub-contracted (out-sourced) management functions, and especially for crew management, competition has often been intense and mergers/consolidations have inevitably followed. At the same time, increasing specialisation in types of ship working in international and intra-national trade, and the range of ship varieties often to be found represented in medium-sized ship owners’ fleets has further complicated the crew management function. These circumstances of growth in scale, regulatory requirement, and specialisation in ships and trades have, simultaneously, complicated the management function and correlatively driven a search for enhanced productivity in administrative processes. With these contextual features to the forefront, this study has investigated the current crew management processes and practices of one of the larger third party ship management companies. Through an action research programme, this study first devised and then implemented new IT instruments, which proved to enhance the efficiency and effectiveness of the administrative process and practices.

The objective of the first “***Diagnostics***” phase of the action research methodology was to investigate the crew management business environment and to specify the symptoms of low productivity and other “problematic” areas in the office administration. Chapter

Three provided the background for the understanding of the essentials of crew management operation in order to inform readers of this study not conversant with shipping industry organizations. The activities of the main commercial players in crew management as well as the shipping regulatory framework were comprehensively described. The first section of Chapter Four presented the results of a questionnaire survey that aimed to collect data relevant to the use of IT and to the level of productivity accomplished in Marlow's office administration. The main symptoms of low productivity were found to be associated with the current in-house administrative workflow process and the lack of integration between IT applications and relevant working procedures. Specifically, "unnecessary paper flow" and "lack of meaningful cost information" were reported to be the two most important symptoms of low productivity.

Once the research problem was clearly defined, the study moved on to "**Action Planning**", the second phase of the research methodology. The objective of this phase was to analyse and interpret the data collected by the questionnaire survey in order to consider alternative solutions for the defined problems. For this purpose, a focus group consisting of the heads of all sections was conducted. The focus group initially provided feedback on the quantitative data produced by the questionnaire survey, and particularly on those related to the identified symptoms of low productivity. Consequently, it proposed some framework characteristics of solutions to the problems discussed (Chapter Four – second section). The key findings derived from the focus group discussion highlighted a number of areas for improvement that formed the recommendations for the main stakeholder of this research. More particularly, the recommendations for changes proposed by the group proved to be critical in shaping adjustments to Marlow's administrative processes and constitute the main findings of this research project. These recommendations, summarized below, introduced the key variables of an integrated HRM system, providing a basis for innovative progression with the potential for differentiation from traditional commercial shipping practices.

- Contrary to traditional shipping administrative practices, crew superintendents were no longer required to physically receive incoming documents such as disbursements and other invoices. These documents were collected, checked, approved for payment and processed into the ledger by accountants in the accounts section. This **workflow change** minimizes the intermediary time lag

(that is the time between the documents being received/ produced and being finally stored into the ledger). Consequently, this produces a significant administrative productivity increment and, at the same time, provides employees with empowerment, which allows them to increase their creativity and initiative, as well as their loyalty to the organization, by allowing them to work with more autonomy.

- In order to accomplish the change explained above, the incoming purchasing source documents would be analysed and processed to the ledger on the **cost-centre basis of a single seafarer**. In other words, the initial “order,” out of which the majority of operating expenses are produced, is the new embarkation or disembarkation of a seafarer. Crew superintendents then become responsible for systematically generating and maintaining the initial information of an order in the common database.
- Developing of a **customized journal entry module** enables the accountant to retrieve operational data, particularly, the “order” information on the basis of a single seafarer, and thus efficiently processing incoming disbursements and other invoices. Additionally, the module, through IT business rules, automatically identifies and prepares for invoicing refundable expenses from clients. This new IT instrument triggers an interest of business organizations to consider the replacement or change of the usual accountant’s journal entry screen to a more customized IT instrument that can offer other functionalities besides the usual posting of journal entries.
- Designing and providing **in-house specialized training** to company’s staff in order to improve their performance and become capable of handling new tasks and duties. Crew Superintendents, for example, needed enhanced knowledge of the basics of financial subjects. They needed training in interpreting operational information extracted from CRM contracts and other business documents to the simple well known terminology that is widely used in the available in-house computer database. At the same time, accountants needed to enhance their knowledge on the basics of crew operational subjects in order to acquire the required competencies and become capable of efficiently and accurately

processing operational expenses source documents. Employees' multidiscipline knowledge through in-house training is therefore a vital component of the proposed organizational workflow procedure.

***“Taking Action”*** is the third phase of the research, which had as its main objective the implementation of the ‘change.’ The ‘action’ primarily reflects a new workflow model built on the basis of the recommendations and ideas proposed in the focus group discussions. IT mechanisms and employees’ task and business processes were combined into a unified crew management system which is thoroughly described in the first section of Chapter Six. The role and main functionalities of all main parts of this system, as well as the data/information flow that ran through it, had undergone research scrutiny. The system was designed to have the following main functional pillars:

- **The Initial Data Providers:** These are the crew superintendents who are the creators of an order on the basis of a single seafarer. An order includes information relevant to the request for service necessary for the movement and employment of seafarers. A specialized IT instrument was developed and implemented in order to convene the processing of this information. The design and development of this instrument took into consideration the time pressure as well as the working conditions usually existing in a crew operation section.
- **The Pivot Data Providers:** These are the suppliers that receive order information from crew superintendents and consequently provide respective services. They are categorized as external suppliers, in-house suppliers, and associated suppliers. The latter group of suppliers are encouraged to issue invoices and disbursements in electronic format suitable for automatic import into the Marlow database system.
- **The Data Processor:** This is a customized journal entry module, which was designed by in-house IT developers to enable accountants to conveniently process business transactions and automatically transfer them into the general ledger. Among other functions, the module provides a central source of information that is used by the accountant to accurately check and verify cost data items of invoices and disbursement accounts documents.

- **The Final Data Station:** This is the accounting software within which the journal entries generated by the “Data Processor” are finally stored and used for reporting purposes. The integration of the two software instruments is accomplished through mapping of all typical journal entry items as well as of relevant dimension codes, which are correlated parameters of the business transaction, otherwise known as cost centres.

The objective of the fourth phase of the research was the “***Evaluation of an Action***”, which is the detailed description of consequences of the implementation of the new CRM system. In the second section of Chapter Six, descriptive statistics were used to measure Marlow’s administrative productivity over the past ten years. The ratio of the office personnel to seafarers employed onboard was used as a productivity indicator. Based on Marlow primary statistical data, **significant improvement in productivity** started to develop in 2005, the year that the AP module (customized journal entry module) was originally implemented. This positive trend in productivity continued with the implementation of the remaining components of the new system in 2007. It further improved with the completion of the enhancements and additions that took place to the innovation during the last action research cycle, the end of the project, in 2010. These results become strong evidence of the successful system performance and, to some further extent, also prove the accomplishment of a primary aim of this project.

The evaluation phase of the research brought up, analysed, and reported a number of other qualitative benefits for the organization. The detailed analysis and recording of cost on the basis of a single seafarer resulted in the **improvement of managerial reporting**. Empirical data, such as crew change cost by port and by seafarer’s nationality, which are perhaps unique for the industry, were made available to crew superintendents and ship operators, optimizing the decision making process and improving the cost efficiency of their daily operation. The extracted reports were also made available to the top level managers and became for them a useful and reliable tool for an effective budgeting of vessels’ crewing operations. Consequently, one of the major symptoms of low productivity (namely the lack of meaningful cost information) was brought to an end.



The automatic identification of refundable expenses is a major functionality offered by the customized journal entry module. This software development significantly **improved the in-house cost control process** and the efficiency by which the company communicates with its collaborating suppliers and clients. The accurate recording and processing of disbursements accounts becomes particularly important considering their high volume and the poor condition of their supportive documentation.

The final part of the Chapter Six describes main **working efficiencies and synergies between sections** that were produced by the new system. It is obvious that integration of data and processes had a positive impact to all organizational sections. The paper flow within sections decreased and employees were able to work with more autonomy. As a result, of the time saving and synergies gained, the quality as well as the control of working tasks had also a significant improvement.

### **Stakeholders Impact**

The detailed evaluation of the first years' results clearly demonstrated the positive contribution of the new system to Marlow organization. Moreover, the continuous post implementation improvements to the various IT developments and related processes indicated a trend and prospects for further productivity enhancement. Generally, the integrated CRM system offered significant working efficiencies and synergies to all Marlow sections involved in crewing activities. The workflow process was designed and developed to cover the needs of the whole administrative area of the organization. It was an outcome of collective effort and participation of several staff-members at all organizational levels always in line with the spiral of participatory action research methodology. As a result of the improved organizational infrastructure, productivity as well as the quality of work were considerably enhanced and have thus provided the company (stakeholder) with a dynamic competitive advantage to operate and progress in the complex shipping business environment. The statistical data and productivity indicator's measurement presented in Chapter Six are primary Marlow data, which clearly demonstrate this positive development and provide strong evidence for the contribution of this project to the organization (see documentary evidence 1).

The findings and recommendations of this research could have a positive impact on the organizational structure and administrative working practices of other ship management companies in the maritime industry. The proposed innovative business process and data workflow can serve as a model for business organizations in international transport, including, of course, those very large ship owners who organise their own crewing operations. This model first and foremost would provide them with better control over the major organizational cost drivers, such as economies of scale, timing, and of capacity utilization and integration. These cost drivers determine the overall cost behaviour, which in turn determines the performance and competitiveness of the organization. Additionally, the reporting capabilities of the system provide unique-for-the-industry information that can be valuable to ship-owners and ship managers. As previously mentioned, already several other Marlow affiliated companies have already adopted the major processes and functionalities of the system.

The main findings of this research are used to enhance the course syllabi of the subject “Human Resources Management” of the maritime program of studies at Frederick University Cyprus. The upgraded course syllabi equip maritime students with industry focused knowledge and skills, enabling them to become easily adapted to their future employers’ needs. Among other things, students are taught the importance of the innovation process and measurement for ship management organization striving to improve administrative productivity and work quality. In this respect, the role of IT and modern computerized accounting methods are subjects which are thoroughly discussed and explained to the students (see documentary evidence 3).

## **7.2 Reflections**

The DProf studies degree program gave me the opportunity to produce a piece of a research which presents authentic project that I had the honour to manage throughout its life cycle stages in a live organizational working environment. After completing this project, it is worthwhile to look back and comprehensively critique the methodology used and to further discuss the impact the study had on my professional knowledge and practice.

Marlow is today one of the world's largest 3<sup>rd</sup> party Crew Management specialist companies; thus, it can be considered as a subject of research with an organizational environment that effectively served the purposes of this project. The participatory nature of *Action Research* methodology was well-suited to convene the smooth implementation of the new system with its peculiar characteristics into the working culture of a ship management organization.

As an active member of the Marlow organization, I was able to deeply investigate and be personally involved in the various administrative functions of the company. This enabled me to obtain a holistic view of the problem, to understand its symptoms, and finally to conclude that drastic structural changes should be made to the general workflow process as well as to the development of IT instruments. My previous extensive working experience in both operational as well as administrative business environments equipped me with multidisciplinary skills and knowledge, which enabled me to practically and effectively contribute to the implementation of innovative changes within the organization. It should be noted, however, that in certain cases, strong hesitation and a negative approach towards the changes have been expressed by a number of employees. In these circumstances, an external consultant was involved, whose neutral view was more easily accepted by the working community (see documentary evidence 2). I have to admit that without his involvement the implementation of IT innovations and relevant working processes would have been much more difficult.

In March 2004, I was assigned by the Directors to assess Marlow's in-house existing ship accounting and related administrative processes and systems. My main role was the coordination of all the activities aiming at the improvement of sections' administrative productivity and synergies. I knew from the beginning that in a complex business environment, as the one in which Marlow operates, the development and successful implementation of any new working practice should be the end result of a thorough and extensive research study. Based on my belief in this statement, I was encouraged to commence a project aiming at the introduction and implementation of a new integrated CRM system within the organization. This effort had the full support of the company's top management from the beginning up until the completion of the project.

In order to obtain an in-depth understanding of the overall Marlow system, the applied methodology I followed was comprised of both quantitative and qualitative research strategies. This approach was adopted on the grounds that mixing or integrating research strategies is considered to be of outmost importance for any well rounded and comprehensive research study. The methodological plan described in Chapter Two was followed with strategic discipline, and through its individual stages, the various problems were faced with a collaborative spirit and respect among the project management team and the other employees. My position in the company as a Project Manager enabled me to ensure the necessary staff involvement in the problems identified, and thus to elicit everybody's constructive participation throughout the whole research cycle.

During the investigation of crew management operations, I have deepened my understanding of Marlow's business environment and, particularly, I have learned the role, key function, and characteristics of all collaborating commercial players. The relevant knowledge and skills accomplished improved my professional capabilities in respect of my role to plan and organize administrative projects in Marlow affiliated business units. The fact that, in 2008, I was assigned by top management to control and supervise the implementation of the new CRM system in the affiliated companies residing in Germany and the Netherlands affiliated companies gives some recognition and appreciation of my professional development. It was at this stage of the study that I realized some of the tangible benefits offered by the Doctor of Professional Studies programme to my professional development.

As Project leader, I thoroughly studied and analysed the existing management information systems (MIS) and working processes. I wanted to ensure that I had an extensive interdisciplinary and in-depth knowledge of all the complex areas involved in Marlow's organizational structure and operation. To this end, I examined the duties and tasks of members employed in various sectors of the company, with whom I kept a constant dialogue and exchange of information during every single phase of the project life-cycle. During the early stage of my research, I conducted informal discussions/interviews with all key personnel, clients, suppliers, seafarers and other project related parties in order to obtain knowledge of their functionalities and understand their needs and problems. It is this experience that taught me how an effective administration of crewing activities can have a direct impact not only to the success of

business organizations but also to the well-being of thousands of seafarers and hundreds of office employees. It is also one of the reasons that make me believe that my DProf. research work positively contributed to and benefited the social and professional relationship of employer and employee.

The aims of the research were clearly set and then explained to the management as well to the remaining staff members in the other organizational levels. I firmly believed that group problem solving results in profound understanding of the problem in question, pioneer (out of the box) solutions, and wider acceptance from all parties involved. Besides, I knew that the objectivity and reliability of any project's results can be better obtained if these results are well understood by the critical communities before applied.

After intensive work using all available human resources including section managers, external consultants, IT programmers, and analysts, I managed to complete the analysis of the organizational environment and more particularly the sections' working processes. A questionnaire survey was then used to specify the symptoms of low productivity and to identify the problematic areas in the office administration. During this stage, I had to take into account complex and specialized working practices that had been in operation for many years. Knowing that the project was expected to produce significant changes into the existing organizational working culture, I tried to instigate the participation of employees where needed, and to take full advantage of Marlow's diversity, as far as cultural and organizational approaches are concerned.

At the same time, with more than 10 nationalities of employees working in-house at the Marlow Cyprus office and dealing with several affiliated companies in different places of the world, I had to carefully manage cultural diversity and control related problems. For this purpose, as mentioned earlier, I collaborated with external consultants with whom we have provided training and development programs aimed at increasing awareness of cultural diversity and promoting a positive attitude towards technological changes. This proved to be an indispensable element in certain phases of the project in which specialized knowledge and professional expertise is required.

Focus group discussion has been an ideal methodology to allow all sections' heads to freely express their views and opinions on the development of an integrated CRM system.

It is through the focus group that quantitative data collected through questionnaires, underwent the scrutiny of qualitative analysis and were finally interpreted to some logical conclusions, which have been agreed to and undersigned by all participants. An action plan has been built based on the parameters set by the focus group, which has been recognized by all staff members as the road map towards the accomplishment of the final project goals.

The result of the project was the creation of an integrated system that is today fully functional, offering speed, accuracy of information, increased labor productivity, and other operational benefits to all sections involved in crewing administrative activities. During the implementation stage, in order to be successful, I had to choose an incremental and iterative project approach. I moved from one business function to the next in order to prepare the build of the various components of the system, whether these were IT instruments or new processes. More importantly, at each step I had to check the desired integration of each system component with the main ledger software. Presently, all types of accounts payable transactions, including manning fees, crew wages, crew land and air travel expenses, are either directly entered or imported from other sources to a customized journal entry module, and from there to the general ledger. This integration of data proved to be one of key factors for the project's success. The accountants and crew superintendents recognised the significant advantages of the customized module, which led to the replacement of the traditional double entry accounting screen. Notably, this change has been also accepted with open arms by members from all sections of the company (critical communities).

The DProf program of studies gave me the opportunity to apply my academic knowledge and professional experience in order to analyse and synthesize information, technological tools and people's ideas into a project that has had significant effects on a variety of operations in a shipping organization. It enabled me to disseminate my theoretical knowledge into workable frameworks and models for practice. Today, some of the functionalities and reporting capabilities of the AP module provide unique information for the industry, which can be very valuable for ship managers and ship owners.

My professional achievements within Marlow Navigation provided me with a major incentive to choose the topic of my research. I strongly believe that the innovative

working processes and IT administrative tools developed and established at Marlow, and which are analyzed through my research work, will significantly contribute to generally improved human resources management within the maritime industry. In summary, overall I have a sense of great satisfaction in the fact that my subject of study is very valuable, appreciated, and contemporary to the professional area in which I am a part of. I feel I have brought an innovative and informative approach to the issues being addressed and that the organizational changes proposed are both desirable and feasible.

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## Appendix 1: The Four Pillars of Maritime Legislation

The maritime regulatory framework lies mainly upon four (4) international Conventions, namely, **International Convention for the Safety of Life at Sea (SOLAS)**, **International Convention for the Prevention of Pollution from Ships (MARPOL)**, **International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW)**, and **Maritime Labour Convention, (MLC 2006)**. Frequently we refer to these conventions as, *the four pillars of maritime legislation*.

The **International Convention for the Safety of Life at Sea (SOLAS)** is the most important treaty protecting and regulating the safety of merchant ships. The first version of the treaty was passed in 1914 in response to the sinking of the RMS *Titanic*. It prescribed numbers of lifeboats and other emergency equipment along with safety procedures, including continuous radio watches. Newer versions were adopted in 1929, 1948, 1960, and 1974. The 1960 Convention — which was activated in 1965 — was the first major achievement for International Maritime Organization (IMO) after its creation and represented a massive advance in updating commercial shipping regulations and in staying up-to-date with new technology and procedures in the industry. The 1974 version simplified the process for amending the treaty. A number of amendments have been adopted since.

**MARPOL 73/78** is the **International Convention for the Prevention of Pollution from Ships, 1973** as modified by the Protocol of 1978. ("MARPOL" is short for marine pollution and 73/78 short for the years 1973 and 1978.) MARPOL 73/78 is one of the most important international marine environmental conventions. It was designed to minimize pollution of the seas, including dumping, oil and exhaust pollution. Its stated object is: to preserve the marine environment through the complete elimination of pollution by oil and other harmful substances and the minimization of accidental discharge of such substances. The original MARPOL Convention was signed on 17 February 1973, but did not come into force. The current Convention is a combination of 1973 Convention and the 1978 Protocol. It entered into force on 2 October 1983. As at 31 December 2009, 136 countries, representing 98% of the world's shipping tonnage are parties to the Convention. All ships flagged under countries that are signatories to MARPOL are subject to its requirements, regardless of where they sail, and member nations are responsible for vessels registered under their respective nationalities.

The **International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW)**, **1978**, as amended, sets qualification standards for masters, officers and watch personnel on seagoing merchant ships. STCW was adopted in 1978 by conference at the International Maritime Organization (IMO) in London, and entered into force in 1984. The Convention was significantly amended in 1995. The *1978 STCW Convention* was the first to establish basic requirements on training, certification and watch keeping for seafarers on an international level. Previously the standards of training, certification and watch keeping of officers and ratings were established by individual governments, usually without reference to practices in other countries. As a result standards and procedures varied widely, even though shipping is the most international of all industries. The Convention prescribes minimum standards relating to training, certification and watch keeping for seafarers which countries are obliged to meet or exceed.

The ILO's **Maritime Labour Convention, (MLC 2006)** provides comprehensive rights and protection at work for the world's more than 1.2 million seafarers. The new labour standard consolidates and updates more than 65 international labour standards related to seafarers adopted over the last 80 years. The Convention sets out seafarers' rights to decent conditions of work on a wide range of subjects, and aims to be globally applicable, easily understandable, readily updatable and uniformly enforced. It has been designed to become a global instrument known as the "fourth pillar" of the international regulatory regime for quality shipping, complementing the key Conventions of the International Maritime Organization (IMO).

## Appendix 2: EU Guidelines on State Aid to Maritime Transport

The EU State aid policy is a very important chapter of Community law and covers all sectors of economic activity. This policy is governed by the EU Treaties: four Community criteria are required for measures for being considered as an aid. They afford their beneficiaries an advantage by allowing them to reduce the tax burden that they would normally bear in the course of their business; this advantage is granted through State resources (the State loses tax revenue); these measures are selective; trade between EU Member States is affected.

One of the main purposes of the *Guidelines* is to encourage the reflagging of vessels in EU Member States in the light of competition from the open registers and the failure in the 80's to establish a Community Register (EUROS). Since the aim of the Commission is to promote the European shipping industry, State aid may generally only be granted in respect of vessels entered in Member States' registers. Member States' registers include, in addition to the ordinary national registers, the Danish International Register, the German International Register, the Madeira International Register, the Canary Islands Register and the Gibraltar Register.<sup>10</sup>

According to the Guidelines, schemes relating to the operation of Ship Registers may be approved, provided that they contribute to the improvement of *maritime safety*. The maximum level of permissible aid to the shipping sector is determined by the Guidelines as being the "reduction to zero of taxation and social charges for seafarers and of corporate taxation of shipping activities". Instead, Member States are allowed to impose on ship-owners *an annual tonnage tax*. Furthermore, the primary objectives of the Guidelines are to improve the competitiveness of ships operating under EU Member States' flags while maintaining high quality standards with regard to safety, pollution prevention and conditions of living and work of seafarers on board. (*Safeguarding EC employment: Preserving maritime know-how in the Community; improving maritime safety*).

Under the *June 2009 Guidelines*, ship managers are also eligible for a similar fiscal alleviation, when they provide crew management services or technical management services (State aid-*annual tonnage tax* reduced up to 75%, in comparison to the tonnage tax paid by ship-owners, as the turnover of ship managers is much less than the turnover of ship-owners. It is assumed that the **turnover** of a ship manager from the management of a ship is equal to 25% of the total turnover that the ship-owner earns from the operation of the ship). Fiscal alleviation for crew management services is subject to certain conditions (e.g. early implementation of the new ILO *Maritime Labour Convention MLC 2006*). The *June 2009 Guidelines* do not allow fiscal alleviation (annual tonnage tax) for commercial shipmanagement services (subject to ordinary corporate tax). This development attests the recognition of the key role played by the ship managers.

<sup>10</sup> The *Kerguelen*, *Dutch Antilles*, *Isle of Man*, *Bermuda* and *Cayman* Registers are not considered to be Member States' registers; however, in certain exceptional cases aid may be granted in respect of vessels entered in these registers provided that the Member State concerned establishes that the register contributes to the Community objectives of safeguarding quality EC employment, preserving maritime know-how in the Community, improving maritime safety;

### Appendix 3: Questionnaire Survey

#### **Purpose of the Questionnaire:**

The purpose of this questionnaire is to gather data regarding the administrative productivity of Marlow Navigation Co. Ltd. More specifically, it aims to identify the problematic areas where improvements and/or changes are or may be necessary.

**1. Here-below is a list of some of the most common symptoms of low productivity in office administrations. Please indicate up to maximum 5 symptoms if you only think that they apply to your section. Show the importance of each selected symptom by marking (✓) a score between 1 and 4 where 1 = least important and 4 = most important.**

**If applicable, mark its importance score:**

1	2	3	4	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear and obvious work flow process does not exist
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unnecessary paper flow between sections / business units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inadequate information flow between sections / business units
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Inadequate number of staff
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lack of meaningful information delays the cost control and verification process
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Non consistent method of checking expenses
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Different format of incoming suppliers' invoices
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Papers travel around sections without employees being able to trace their current location
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Poor lay-out of desks
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Quality factor in assigned tasks is not given the proper attention

**2. Mark (✓) one of the below options which you believe indicates the most accurate measure on how efficiently and effectively the company is using available IT instruments?**

\_\_\_\_\_ Not at all

\_\_\_\_\_ A little

\_\_\_\_\_ Quite a lot

\_\_\_\_\_ Very much

\_\_\_\_\_ Maximum possible

**3. Have you ever thought that your organization sometimes has a tendency to jump from one large project to another with no real sense of connectivity between them? If yes; how destructive to your work have you find this?**

\_\_\_\_\_ Not much really

\_\_\_\_\_ It was difficult at the time but it all settled down

\_\_\_\_\_ I find it really hard

4. Below is a short list of what are often regarded as the main reasons for reluctance to changes in existing IT methods / instruments. Show the importance of each reason by marking ( ✓ ) a score between 1 and 4 where 1 = least important and 4 = most important. If you think there is any other important reason, please say what it is in the space below and give its respective importance score.

**Score of Importance**

1    2    3    4

--	--	--	--

Lack of employees IT knowledge

--	--	--	--

Uneven workload balancing between sections

--	--	--	--

Lack of adequate familiarization training (based on past experience)

--	--	--	--

The difficulties of change

--	--	--	--

No real need

--	--	--	--

Other reason:

5. Are you often distracted from a job in hand by being given additional tasks? If you are, is it:

\_\_\_\_\_ Sometimes

\_\_\_\_\_ Often

\_\_\_\_\_ Rarely

6. Do you believe that more employees' participation at all levels of the organization in forming and revising policies and ideas will improve their results?

\_\_\_\_\_ Agree

\_\_\_\_\_ Disagree

\_\_\_\_\_ Sometimes

\_\_\_\_\_ Not Really

7. Do you believe staff training will improve the performance and productivity of your section?

\_\_\_\_\_ It should if it's good enough

\_\_\_\_\_ Eventually

\_\_\_\_\_ It should but may not

Any other comment:

8. If you would like to make any other comments about Marlow administration process, then please do so.



Evidence 1



## Evidence 2



**ACOTES GmbH**

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**To: Middlesex University**

**Re: DProf. Evidence**

ACOTES GmbH has been working for Marlow Navigation Co. Ltd since 2005. Our role is to deliver Business Consultancy for the areas of:

- Change of Business Processes
- Selection of Computer Programs
- Providing guidance to in-house program development

As a résumé one can state that navigating today's Marlow's organisation through the complex competitive environments is at least as complicated as flying a jet. The job we had to carry out was to generate workable solutions and providing an educational infrastructure to match everybody's needs in the organization by sustaining the on-going business. We were and we are still working within multi-national environments and with people who are embedded in different cultures and work ethics.

We assisted in adopting the right measures by providing the answers to the following questions:

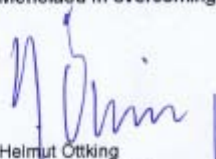
- How do we retain stakeholder's loyalty?
- What must we be successful at?
- How can we continuously improve in everything we do?
- How can we translate all this into the right IT system?

To reflect the above questions against the status of Marlow's processes and systems in we came very rapidly to the conclusion that a comprehensive change programme for the administration (call Back Office functions) was overdue. Our task was to increase Management awareness and/or understanding about those developments that would inevitably result into much higher productivity of those back office functions. Carefully prioritising the list of "Changes" was the second and most important step in this mayor upheaval.

Together with Mr Menelaou we worked out the impact for Marlow administrative processes to develop and implement a fully systemized workflow model. It was clear that this task could only be carried out by keeping Marlow's daily operations undisturbed. The Creditor Administration was spread over several organisational functions – and with hindsight, this is right and caters best for the business needs.

The original template for all Accounts Payable (AP) modules – catering for 8 different functions – was taken from the earlier Disbursement System. This system was designed in line with business functionality by Mr. Menelaou.

The AP Module is currently in use by the Marlow subsidiaries in Rotterdam and Hamburg (implemented as of 2008). User training was provided by Mr. Menelaou. Our experiences so far shows that acceptance of new technologies are differently levelled between the subsidiaries. We supported Mr Menelaou in overcoming the different "IT attitudes" and cultural multiplicities problems.



Helmut Ottking  
Managing Director /  
Senior Business Consultant

19 August 2010

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### Evidence 3



#### PLANNING FORM FOR AN EDUCATIONAL MODULE (to be completed by the teacher)

Programme of Studies:	<b>Maritime Studies</b>
Name of the module:	<b>ABSO 204 – Human Resource Management</b>
Target group:	<b>Maritime Studies students</b>
Level of the unit:	<b>BSc. – 2<sup>nd</sup> Semester</b>
Entrance requirements:	<b>ABSO 103</b>
Number of ECTS credits:	<b>5 (Average student working time: 125 hours)</b>

Competences to be developed:	
1	Knowledge and understanding on the activities concerning the management of seafarers.
2	Analyse the Human Resource functions such as recruitment, selection, planning, training and development, performance appraisal, legal environment and labour relations.
3	Apply the different methods available for effectively recruiting, selecting, compensating, developing, as well as appraising seafarers.
4	Ability to translate and disseminate theoretical knowledge into workable frameworks and/or models for practice in the area of HR in the shipping industry.
5	A critical awareness of particular crew management processes and practices that emphasise pragmatic and applied outcomes relevant to ship management and ship owning organizations.

Estimated student's work time distribution in hours:			
Conduct hours		Student's private time	
Lecture	35	Private Study	25
Mid-Term Test	4	Lab Report	0
Final Exam	3	Homework	10
Project Presentation	0	Test Preparation	17
Lab Work	0	Final Exam Preparation	22
Lab Assessment	0	Group Project Preparation-Assignment	9
Total:	42	Total:	83

## Learning outcomes

**At the end of the course students will be able to:**

- understand the role and functions of the major players of crew management;
- know the scope, major functions and conventional practices of the HR department within ship management organizations;
- understand the relationship between vessel's manning costs and profit and have an overview of cash flow management and budget control processes;
- Understand the impact of IT systems and computerized accounting on productivity and quality;
- be aware of the alternatives for a crew manning policy;
- know the reasons behind the trends of seafarers global supply and demand;
- have an overview of the main duties and responsibilities of Master, officers and crew;
- understand the ethical implications in respect to seafarers' employment and ship board life
- appreciate the importance of a structured seafarers' training and development programs;
- be aware of the key regulators and other international bodies affecting crew management operation as well as of the major conventions that apply to the maritime industry.

## Course Content (Syllabus):

This course of Crew Management aims to equip students with industry focused knowledge to assist personal and professional development towards becoming an informed professional manager in the area of human resources. The students have the opportunity to obtain an in-depth understanding of the role, functions, regulatory environment and relationship of the major crew management commercial players. Furthermore the course explores the important functions and practices employed by crew managers in selecting, recruiting, planning and training their sea going personnel. Finally, the students acquire knowledge on innovation-based working processes which aim the improvement of administrative productivity and quality of work.

## Teaching Methodology:

- Lecturing in an ordinary class (supported by PowerPoint presentations and handouts for each lecture)
- The approach is learner-centred employing directed reading, resource-based learning, candidate reflection and tutorial guidance (optional) as primary supports.
- Tests
- Home Assignment – Analysis of current crew management practices
- Presentation/Discussion of Assignments

Assessment Type		Weights
Midterm Test 1		20%
Midterm Test 2		20%
Final Exam		60%
	<b>Total</b>	<b>100%</b>

Mid-Term Tests	4
Final Exam	3
Group Project Presentation	0
Lab Assessment	0
<b>Sub-Total:</b>	<b>7</b>